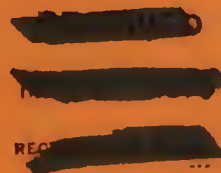


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Recreation in the Dillon Resource Area

by Andrew Epple
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*Recreation in the Dillon
Resource Area*

*by
Andrew C. Epple
December 1977*

ABSTRACT

This report estimates the amount and dollar value of recreation in the BLM's Dillon Resource Area (southwest Montana). Summer recreation estimates were made for the entire Resource Area, while fall use estimates were made for each allotment within two of the Resource Area's planning units (Dillon West and Tendoy). Other selected areas were also dealt with in the fall study.

Several measurement techniques were utilized to determine recreational use. For the summer study, vehicle counts taken on a random basis provided total use estimates, while personal interviews indicated sure preferences and values. Fall recreational use was measured through aerial surveys, herd census and habitat analysis, and ranchers' estimates.

Dollar value estimates of recreation were made by multiplying recreational day values times the estimated number of recreational visits.

Summer recreation in the Dillon Resource Area revolved primarily around trout fishing, with rockhounding and just camping also popular. Fall recreation in 1977 in the Dillon Resource Area was limited to hunting for antelope, deer, elk, waterfowl, and upland game. A lack of snow on the ground prohibited snowmobiling and cross country skiing, activities that would normally occur in the area.

ACKNOWLEDGEMENTS

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Table of Contents

	<u>Page</u>
Abstract	ii
Acknowledgements	iii
Introduction	1-2
Part One: Summer Recreation	3
I. The Study Areas	5
A. Pioneer Study Area	5
Big Hole River	5,7,8
Ruby Reservoir	8,10
Big Sheep Creek	10
East Fork Blacktail	12
Other Areas	12
B. Madison Study Area	13
II. Research Methodology	14
A. Data Collection from Intensively Used Sites	14
Sampling Technique	14
Vehicle Observation Sheet	15
Sample vs. Sampling Frame	15
The Questionnaire	15-16
Interview Technique	17
B. Data Collection from Remote Primitive Camps	17
III. Data Analysis	18
A. Amount of Recreation Use	18
B. Responses to the Questionnaire	20
IV. Conclusions on the Summer Season	38
A. Summer Use in the Pioneer Study Area	38
Ruby Reservoir Campground	38-39
The Big Hole River	47
(Special Topic)	
Big Sheep Creek	47
East Fork Camp	49
Other Pioneer Study Areas	51
B. Summer Use in the Madison Study Area	51
C. The Resource Area as a Whole	51-52

V. Recommendations	53
A. The Pioneer Study Area	53
Ruby Reservoir	53
Divide Bridge Camp	54
Dickie Bridge Camp	54
Ponderosa Camp	54
Big Sheep Creek	55
East Fork Camp	55
B. Madison Study Area	55
C. The Resource Area in General	55
Part Two: Fall Recreation	58
VI. Methods of Use and Value Estimation	59
A. Aerial Observations	59
B. Herd Census Analysis	60
C. Acres of Habitat Analysis	61
D. Rancher Estimates	62
E. Value Estimation	62-63
VII. Fall Use Estimates	64
A. Dillon West and Tendoy	65-68
B. Other Areas	69-70
VIII. Conclusions and Recommendations on the Fall Study	71
Part Three: Areas That Provide Both Summer and Fall Recreation	72
Afterword	73
Appendix A (Vehicle Observation Sheet)	74
Appendix B (Questionnaire)	75-76
Bibliography	77-78

INTRODUCTION

The purpose of this study was to determine the amount, patterns, and economic value of recreation on Dillon Resource Area BLM lands in southwest Montana. The information contained in this report will hopefully enable the BLM to make sound land management decisions that reflect the attitudes, desires, and needs of the BLM recreation user. In addition, the economic information will enable planners to realistically evaluate costs, benefits, and tradeoffs associated with recreation and competing land uses such as grazing or mineral extraction.

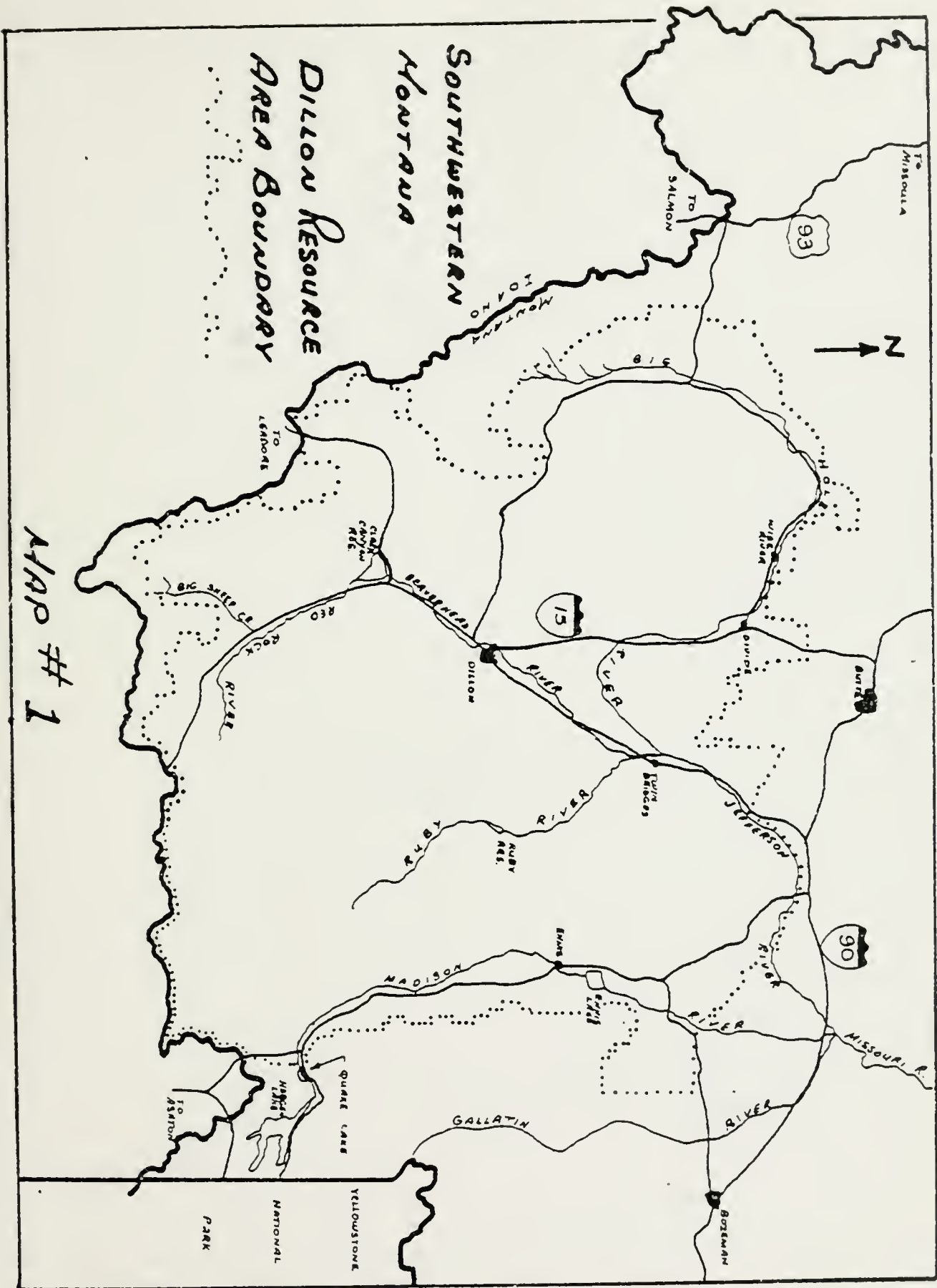
The first part of the study (Part I) was conducted during the summer of 1977 by two graduate student interns. Funding was provided through the Western Interstate Commission on Higher Education (WICHE), while facilities and resources such as office space, vehicles, and related goods were provided by the Bureau of Land Management's Dillon Resource Area office.

For the summer study the Dillon Resource Area was divided into two general regions of study: the Madison River Study Area and the Pioneer Study Area (see Map 1). The Madison Study Area basically coincided with the Madison River Planning Unit and included all BLM allotments along that river from just below Quake Lake in the south to the point where State Highway 289 leaves the lower river enroute to Bozeman. The Pioneer study area included parts of the Rochester, Ruby, Dillon West, Tendoy and Blacktail Planning Units and derives its name from the dominant mountain range in the western Dillon Resource Area. The primary study sites within this area included BLM undeveloped and primitive campsites along the Big Hole River, Big Sheep Creek, and East Fork of the Black Tail Deer Creek, and at Ruby Reservoir.

Donald C. Baty, one of the aforementioned WICHE interns and a graduate student in forestry from the University of Montana, gathered recreation data from the Madison River Study Area. A detailed report of his findings appears in a separate WICHE publication. The author of this report, a graduate student in geography from the University of Utah, conducted the recreational survey in the Pioneer Study Area. Results of the Pioneer Study are treated in detail in this document along with the summarized findings from the Madison River study. The findings from the two study areas combined provide 1977 summer recreational data for the Dillon Resource Area as a whole.

Part II of this study was conducted during the fall of 1977. Recreational use data was collected from each allotment within the Dillon West and Tendoy Planning Units and from other general areas within the Resource Area. Dillon West and Tendoy were analyzed carefully since URA updates for these planning units were needed immediately. General areas such as Hungug Spires and Clark Canyon were also examined, but recreation in these locations was not broken down by allotment. Due to lack of manpower and time, fall recreation in the Madison and Ruby Planning Units was not analyzed.

Part III of this report combines summer and fall recreation data for the few allotments and areas where use was observed during both seasons.



SCALE: 1" = 20 MILES

Part I

Summer Recreation
in the
Dillon Resource Area

CHAPTER I THE STUDY AREAS

A. THE PIONEER STUDY AREA

Summer data collection and analysis within the Pioneer Study Area was primarily undertaken at sites known to experience moderate to heavy recreational use. These locations included those BLM undeveloped and primitive camps along the Big Hole River, Big Sheep Creek, East Fork of the Blacktail Deer Creek, and at Ruby Reservoir. For purposes of this study, undeveloped camps have no running water, but do have outhouses, trash cans, and fairly well defined campsites. Campgrounds of this nature in the Pioneer Study Area occur along the Big Hole River and at Ruby Reservoir. Primitive camps, such as those found along Big Sheep Creek and on the East Fork of the Blacktail Deer Creek, provide no running water, restrooms, or trash cans. They do, however, have well defined campsites.

The Pioneer Study Area also included at least two areas (Agate Mountain and Big Hollow) where recreation occurred in a sporadic, difficult to measure fashion, and several thousand acres of rangeland that offered little in the way of summer recreation opportunities. Accurate data was not collected from these areas, but they are dealt with peripherally in this report. (Recreation on open rangelands increased significantly during the fall when game birds and antelope attracted numerous hunters: See Part II of this report).

I. The Big Hole River

The Big Hole River is the largest of three rivers (the Beaverhead, the Ruby, and the Big Hole) that come together and form the Jefferson River near Twin Bridges. The Big Hole's headwaters lie in the southern end of the Big Hole Valley, where the Big Hole Divide and Continental Divide join near the Montana-Idaho border. From there it flows in a northerly direction, being fed by numerous streams and creeks that drain the eastern slopes of the Bitterroot Mountains and the western slopes of the Pioneer Mountains. Downstream from Wisdom, the river veers to the northeast, leaving the Big Hole Valley and picking up streams from the Anaconda Range and north slope of the Pioneers. Beyond Deep Creek, the Big Hole River turns southeast and enters a scenic canyon through which it flows until reaching the Divide Bridge some twenty miles downstream. It is in this canyon that two BLM undeveloped camps exist; one at Dickie Bridge and one at Divide Bridge. Several miles downstream from Divide, the BLM maintains a third campground, known as the Ponderosa Camp (see map 2).

a. Dickie Bridge Campground

Located seven miles upriver from Wise River where Dickie Bridge crosses the Big Hole River, Dickie Bridge Campground can accommodate approximately thirty campers a day in nine campsites. The campsites are generally located in the heavily

wooded flood plain adjacent to but slightly above the south bank of the river. The area can only be termed extremely scenic. A wide variety of vegetative types exist, ranging from low shrubs and grasses to thick underbrush to several kinds of deciduous and evergreen trees. In addition, the proximity to the river and State Highway 43 makes the camp attractive to both fishermen and travelers alike.

A dirt road runs through the campground parallel to the river. Three of the nine campsites are squeezed between the road and the river bank while the remaining six are separated from the river by the road. Short spur roads off the dirt road provide access to the individual campsites.

Most of the campsites at Dickie Bridge are well isolated from one another and provide excellent camping opportunities for one vehicle parties. However, the three along the riverbank are extremely close to the camp road which carries a fair amount of traffic beyond the BLM land to private holdings upriver. The camping area closest to the highway can comfortably accommodate large groups or three to five individual groups of campers. Flat terrain and soft earth make all of the campsites suitable for tent, trailer, camper, or motor home camping.

Facilities at Dickie Bridge Campground include a restroom and two trash cans, all of which are located in the group camping area close to the highway. Beyond these facilities, the camp is truly undeveloped, lacking water, fire rings, tables or other amenities.

b. Divide Bridge Campground

The BLM campground at Divide Bridge is also undeveloped but offers individual and group camping sites suitable for tents, trailers, motor homes, or campers. In addition, the area closest to the highway is ideal for picnics and short term day use.

Trash cans at the picnic area and a restroom at the other end of the camp constitute the area's facilities. A badly rutted road leaves the highway, turns parallel to the river, and provides access to at least four individual, secluded campsites along the river before entering an open field bordered by aspen. This open field is suitable for group camping. None of the campsites at Divide Bridge are equipped with tables, fire pits, running water, or other amenities.

The campground's proximity to the Big Hole River and nearness to the highway make it an ideal picnic, camping or fishing access site. Lush riparian growth along the river banks, aspen trees and meadows away from the banks, and a backdrop of forested hillside combine to make Divide Bridge Campground extremely attractive.

c. Ponderosa Camp

This BLM campground is least accessible of the Big Hole undeveloped camps and consequently the least used. It is located approximately five miles upriver from Melrose, but is accessible only by a ten mile dirt road (in very bad condition) that leaves the highway at Melrose, meanders through arid, hilly range land, joins the river again at Maiden Rock, and ends at the BLM camp. The area is very scenic, with thick stands of ponderosa, aspen, and brush surrounding the river front campsite. This campsite can accommodate up to twelve people in three or four vehicles, but rarely experiences this kind of maximum use. Large recreational vehicles such as motor homes and big trailers have a difficult, if not impossible, time attaining the camp due to the long unimproved road.

The area's only improvement is a restroom. Running water, tables, and fire pits are missing.

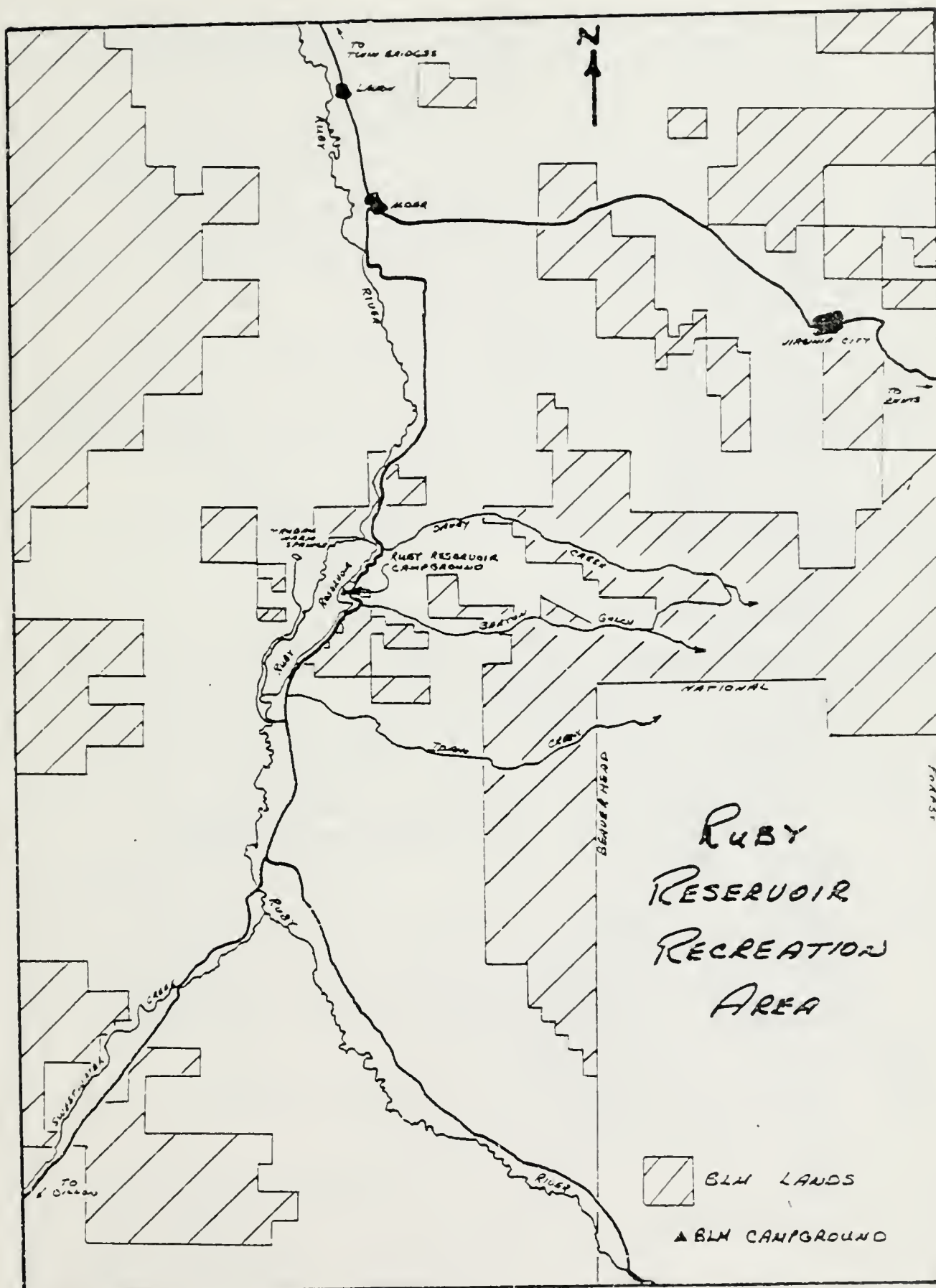
d. Other BLM Lands Along the Big Hole River

BLM lands along the Big Hole River between Melrose and Twin Bridges provide recreation for a significant number of people, but accurate data was not collected from these areas. No estimates of use were made, but they should be studied in future years to determine just how intensive the use is in these areas.

2. Ruby Reservoir Camp

Located fifteen miles east of Dillon in the Ruby Mountains, Ruby Reservoir can be reached by a long dirt road from that town or by a paved road from Alder, which lies seven miles below Ruby Dam (see map 3). The Ruby Mountains provide excellent rock hunting, and much of the activity at Ruby Reservoir Camp revolved around this form of recreation. In addition, good fishing in the lake's deeper waters attracts numerous fishermen, while frequent calm water provided ideal conditions for water ski enthusiasts. Dirt bikers pursue their hobby on the dirt roads that surround the reservoir.

The campground itself provides little in the way of natural or man-made amenities, although shoreline vegetation does offer some relief from the otherwise barren landscape. Located on the eastern shore of the backed up waters, the campground is characterized by a lack of individual, secluded campsites. Rather, the main camping area is an open field that slopes moderately to the water's edge. Vehicles with trailers, campers, camper vans, motor homes, dirt bikes and dune buggies have rendered much of this open field camping area void of vegetation. The resultant dirt is highly compacted and suffers from rill and gully



SCALE: $\frac{3}{8}'' = 1 \text{ MILE}$

erosion. The camp's roads are rutted, and only a few areas within Ruby Reservoir Camp are level. Two outhouses and some trash cans constitute the area's facilities. Running water, shade, tables, and fire rings are absent.

In spite of its shortcomings, Ruby Reservoir Camp attracts more recreationists than any other Pioneer Study Area camp. This is due to the fact that the reservoir and surrounding areas provide such diverse recreation opportunities for a wide group of people. In addition, although the camp area itself lacks scenic value, the colorful Ruby Mountains across the lake and steep, wooded hills behind compliment the deep blue waters beautifully.

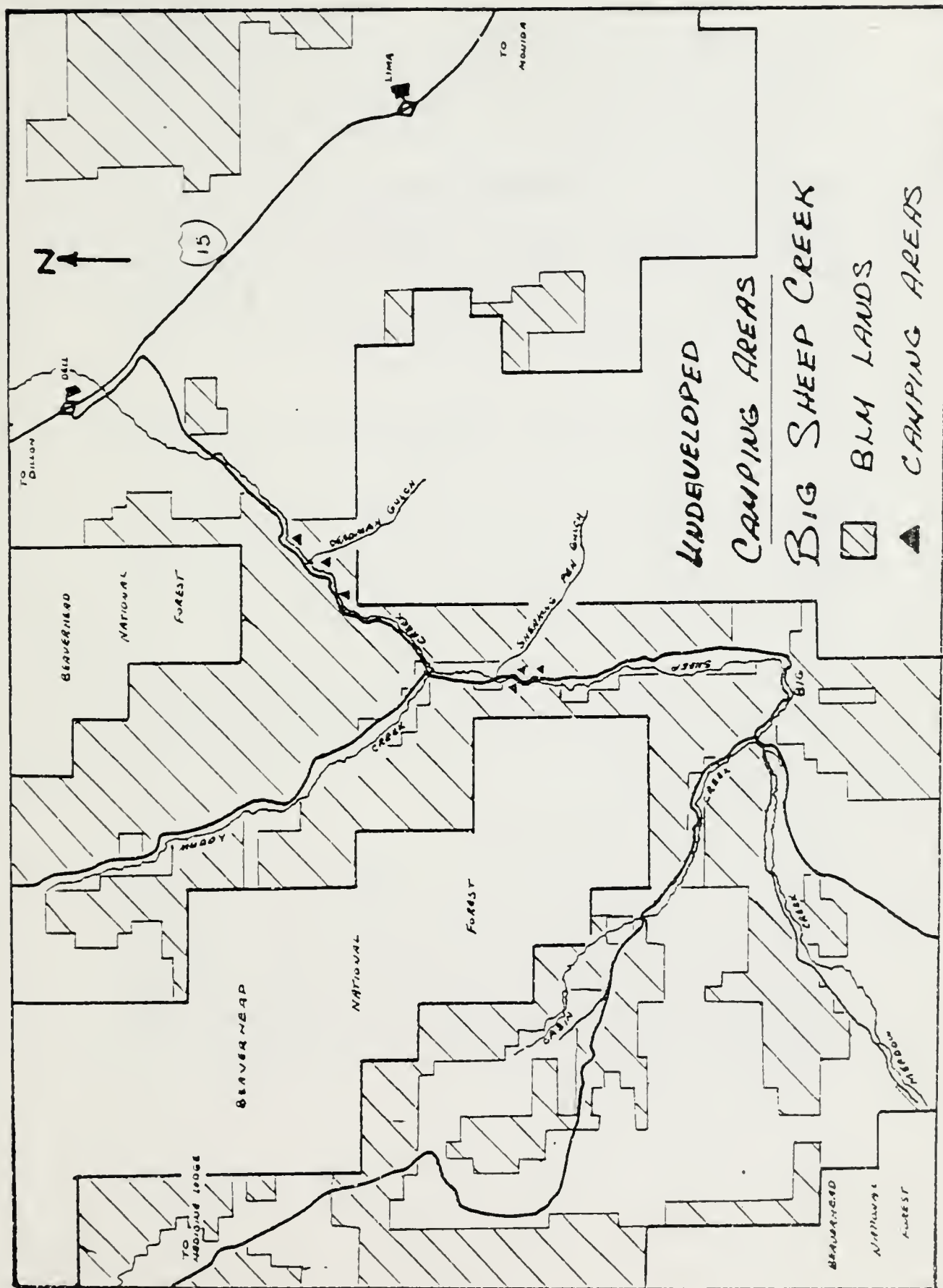
Recreation use at Ruby Reservoir curtails somewhat as the summer progresses. Water levels drop drastically toward the end of August, which makes boat launching from the dirt ramps inconvenient and hazardous. However, on weekends early in the summer (when water levels are high) use at the BLM camp approaches capacity, which is approximately 45-50 vehicles or 150 recreationists per day. When used to capacity, the three acre camping area is packed with recreation vehicles, tents, boats trailers, automobiles, and dirt bikes, resembling a recreation boom town on wheels.

3. Big Sheep Creek

Draining the eastern slope of the Continental Divide in extreme southwestern Montana, the cold, fast moving waters of Big Sheep Creek provide excellent trout habitat and fishing opportunities (see map 4). The creek flows through a scenic canyon of high palisades and wooded peaks, much of which is managed by the BLM. A dirt road from Dell leads up the canyon alongside the creek. Turnouts from this road enable campers and vehicles pulling trailers to set up camps in a number of grassy meadows that exist between the road and the creek. These sites are extremely scenic, surrounded by lush vegetation and dramatic canyon scenery.

The BLM has done very little to improve these camping areas, a fact that is appreciated by the public. The lack of restrooms, trash cans, tables, and tap water makes the area truly primitive in nature. The camping areas have evolved as a result of the recreational use they experience, not through any development efforts on the part of BLM.

Big Sheep Creek Road is in fairly good condition (although heavily used by ranchers) and provides adequate access to public lands along the creek.



Several of the camping areas are suitable for group camping while several others offer secluded single party camping. Campsites along Big Sheep Creek could accommodate up to twenty-five vehicles per day, or approximately 70 to 80 recreationists. This sort of maximum use is rarely achieved, however, which makes for generally uncrowded primitive camping within Big Sheep Creek Canyon.

4. East Fork of the Black Tail Deer Creek

Located forty dirt road miles southeast of Dillon on the lower slopes of the Snowcrest Range, the East Fork Campground is a primitive camp on the banks of a very productive trout stream. The dirt road that provides access to it ends at the campground, which is surrounded by large stands of evergreen and aspen trees. There are no improvements in the area except for a few corrals and hay bins which have been constructed by the fall hunters.

Summer activity at the East Fork Camp generally revolved around fishing in the creek and dirt biking on the trails that lead back up from the camping area into the Snowcrest and Gravelly Mountains.

Campsites at the road's end include a main camping area which can accommodate up to five vehicles and three one or two car campsites. Capacity at the camp is estimated at approximately twenty-five to thirty recreational visits per day. Due to the area's remoteness, however, capacity use is infrequent. Levels of use have risen in the past few years, however.

All campsites are located above the road with respect to the creek. As is the case with the campsites along Big Sheep Creek, campsites at the end of the East Fork Road have developed as a result of recreational use (i.e. vehicles simply pulling off the road at a suitable spot) rather than as a result of any management decisions on the part of BLM.

5. Agate Mountain and Big Hollow

Agate Mountain and Big Hollow, both located in the Dillon West Planning Unit, are known to receive summer recreational use in the form of rock hounding and fishing, respectively. The former is located near Bannack Pass and the Continental Divide while Big Hollow is a side canyon that joins Bloody Dick Creek six miles west of Red Butte. Recreation data was not collected from these areas on a regular basis....crude estimates of use are based on infrequent observations and questionnaires mailed to rock hound clubs in Idaho known to visit Agate Mountain.

B. THE MADISON RIVER STUDY AREA

Information regarding the amounts, patterns, and economic value of recreation on BLM lands along the Madison River was collected by Don Baty, also a WICHE intern working out of the Dillon BLM Office. An in-depth description of the Madison River Study Area appears in his report. Briefly, the study area included all BLM allotments along the Madison River from just below Quake Lake in the south to the point where State Highway 289 leaves the lower river enroute to Bozeman. Data and information collected from the Madison Study Area during the summer of 1977, are summarized and presented in this document as part of the recreational data for the Dillon Resource Area as a whole.

CHAPTER II

THE SUMMER RESEARCH METHODOLOGY

The purpose of this project was to collect and analyze data that would enable researchers to determine the amount, patterns, and economic value of recreation provided by Dillon Resource Area lands. BLM lands in the Dillon Resource Area that provide recreational opportunities can be classified into three groups: (1) Developed and undeveloped campgrounds that experience moderate to heavy (intense) use; (2) Remote primitive camps that experience relatively light recreational use; and (3) Non-point areas that experience dispersed recreational use.

Recreation data was gathered from each kind of area in the Dillon Resource Area during the summer of 1977 (July 1 to September 5), but the method of collecting data varied according to the type of area surveyed.

A. DATA COLLECTION FROM INTENSIVELY USED BLM SITES

The bulk of recreational use on Dillon Resource Area BLM lands occurs in nine developed and undeveloped campgrounds along the Madison and Big Hole Rivers, along Big Sheep Creek, and at Ruby Reservoir. Researchers involved in the project devoted most of their time and energy to obtaining reliable data from these intensively used areas. The method of obtaining data from the Madison River Study Area was essentially the same as the method used to obtain data from the Pioneer Study Area.

1. The Sampling Technique

Ideally, the best method of obtaining data on the amount and patterns of recreation provided by intensively used Dillon Resource Area BLM lands would have been to conduct a complete survey in which every recreational visit was counted on every day of the summer. Such a survey was of course impossible to conduct.

In lieu of a complete survey, researchers developed a technique whereby (1) an estimate of total recreational use for the areas during the summer of 1977, could be obtained, and (2) a representative sample of recreationists from each of the intensively used sites could be obtained.

The technique basically involved collecting data from the intensively used sites on predetermined days throughout the summer. Data collection days for a given site were selected through the use of a random numbers table, with potential data collection days (from July 1 to September 5) being assigned numbers ranging from 01 to 59. After a given day was selected for data collection, it was withdrawn from the list of potential days for selection since only one site could be sampled per day. This technique of sample selection was applied to each site until data from the area was to be collected once on a Sunday, once on a Monday, and so on for each day of the week. In addition, each area was

sampled one day during each of the two holiday weekends...July 4th and Labor Day. By collecting data from each site on each of the seven days in the week plus two holiday days, a reliable representative sample of the total recreation population was obtained. Also, information recorded on the vehicle observation sheet (see next section) enabled researchers to make accurate estimates of total recreation use for the summer season.

2. The Vehicle Observation Sheet

Data collection from a given site on each predetermined sampling day was carried on during an eight hour sampling period, between 8:00 a.m. and 4:00 p.m. During the sampling period the total number of vehicles observed at the site was recorded on the vehicle observation sheets (Appendix A). Vehicles in the area whose occupants were obviously not engaged in some sort of recreation (i.e., maintenance crews, ranchers, or Government personnel) were not recorded on the sheet. The information on the vehicle observation sheet accurately described the total amount of use at the given area on that particular day. Obtaining this information for nine days throughout the summer enabled researchers to estimate total summer use for an area with a high degree of confidence.

3. The Sample vs. Sampling Frame

Using the vehicle as the basic unit of measurement, researchers attempted to conduct in-depth interviews with one person from each observed vehicle. These interviews provided information on the characteristics and preferences of the recreating visitor. Since the occupants of some vehicles were impossible to locate or left the area before an interview could be conducted, the actual number of interviews (the sample) represented only 52% of the total number of observed vehicles (the sampling frame). However, the information obtained through the on-site interviews (such as average number of people per vehicle and average amount of money spent per vehicle) was projected to the total number of observed vehicles to yield information about the amount and characteristics of recreation provided by that site on the given day. This information was in turn expanded to provide characteristics of the total number of recreation visitors estimated for the summer.

4. The Questionnaire

A copy of the questionnaire used to obtain data from intensively used recreation areas in both the Pioneer Study Area and the Madison Study Area appears in Appendix B. The questionnaire, administered verbally by the interviewer, was designed to be as short and simple as possible while still providing important information. It could take as little as five minutes to complete, but since some of the questions were designed to elicit broad responses about management direction and user preferences, many of the interviews went on for thirty minutes or more.

The purpose of many of the questions is obvious. Question 1 (origin of trip) was recorded by state or province for non-residents, and by county for Montana residents. The number of vehicles observed, rather than people, was recorded on the observation sheets. The average number of people per vehicle was computed from Question 2 of the questionnaire and multiplied times the total number of vehicles observed in order to produce a figure for the total number of recreationists. Question 4 was designed to ascertain the relationship of recreation use in the Dillon Resource Area to Yellowstone Park and other scenic and historical attractions in the region. Responses were recorded in three categories; whether the interview site was the primary destination of the trip, one of multiple destination, or just stopping spot enroute somewhere else (traveling through). Questions 5, 6, 7, and 8 taken together (total length of trip, days in Montana, days in the area, and nights at specific interview site) serve to indicate what percentage of the total recreational trip was spent in the Dillon Resource Area. Question 10 was only of importance at McAtee Bridge on the Madison River where most of the interviewers were floating the river with a guide. Question 11 was basically designed to breakdown economic expenditures in order to help the interviewee answer Question 12 (total trip expenditures) and Question 13 (expenditures in Montana). It also provided a general indication of the kind of items recreationists spend money on. Question 12 and 13 were used to ascertain the average expenditure per day per recreationist. When multiplied times the total number of recreationist, this figure gives an indication of the economic value of recreation use on BLM lands within the Dillon Resource Area. Question 14 indicated the number of people who were returnees and also enabled the researcher to compare the difference in responses between long term users of the areas and people visiting the area for the first time. Question 15 was designed in order to determine if recreationists felt there should be more or less access to the interview site.

Question 17 (likes) was basically a lead in for Question 18 (dislikes). These two questions taken together were perhaps the most important on the questionnaire. Interviewees were encouraged to list any particular assest or problems they saw in the area. When the question was designed, it was known that there were some conflicts on the rivers, such as between bank fisnermen and boats, but rather than lead the respondent by asking anything specific about problems or conflicts it was decided to ask an open ended question. If any real problems exist, the dislike question should have revealed them. Question 19 backs up the dislike question. If an interviewee indicated they would not return they were asked why. Questions 20, 21, and 22 were designed in order to ascertain how aware recreationists were of the BLM and BLM recreation management efforts.

A total of 505 interviews were conducted in the nine areas of concentrated use during the course of the summer season, 178 in the Pioneer Study Area and 327 on the heavily used Madison. It is estimated that these interviews represented 1% of the total summer recreation population.

5. Interview Technique

The interviewers approached prospective respondents and identified themselves as graduate students conducting a recreation survey for the BLM. Virtually all recreationists were willing to cooperate when asked if they would answer a few questions. As the interview was conducted, respondents were encouraged to elaborate on their answers while the interviewers made notes of their additional comments. These comments proved invaluable in gaining insight into the preferences and opinions of the users. When the interview was concluded, respondents were given a set of BLM recreation maps of southwest Montana.

B. DATA COLLECTION FROM REMOTE PRIMITIVE CAMPS

Data collection from remote primitive camps in the Dillon Resource Area (Ponderosa Camp on the Big Hole and Road's End on the East Fork of the Blacktail Deer Creek) involved the use of traffic counters and register boxes rather than the direct observation techniques described in the preceding section. This was due to the fact that use in these areas was too light to warrant spending an entire day observing the activity there.

Although compliance rates at register boxes can vary significantly and interpretation of traffic counter data can be misleading, they can yield "ballpark figures" that can be useful for roughly estimating total use. These rough estimates of total use are presented in the following chapter.

Visitors who opened the register boxes were asked, through a brief introductory statement to answer several questions on an abbreviated version of the questionnaire used in the personal interviews. The register box questionnaire dealt only with those questions deemed most essential to the project; length of trip, number of people per vehicle, amount of money spent per vehicle (in Montana and on the whole trip), and the party's primary activity.

CHAPTER III DATA ANALYSIS

A. AMOUNT OF RECREATION USE

Table I presents recreation use estimates for the Dillon Resource Area from July 1 to September 5, 1977. The use estimates are reported in recreational visits, with a recreational visit defined as one person engaged in a recreational activity for one day or any part of one day. Total estimates are given for the Pioneer Study Area, the Madison Study Area, and the Dillon Resource Area as a whole. Use estimates for each of the intensively used sites within the Pioneer Study Area are presented, as are the less accurate use estimates for the Ponderosa and East Fork camps. The table also indicates each site's maximum daily capacity.

The use estimates for the intensively used areas in the Pioneer Study Area were derived from observing the number of vehicles at each site on nine randomly selected days throughout the summer season; five weekdays and four weekend or holiday days. This technique was also used to arrive at use estimates for the Madison Study Area. Based on these observations, average weekday and weekend day use figures were calculated. The average weekday figure for each area was multiplied by forty-five, the number of weekdays in the July to September 5 season. The average weekend day figure was multiplied by twenty-two, the number of weekend days in the study season. Adding the two figures yields an estimate for each area for the whole season, based on a 13% sample (nine observed days out of sixty-seven potential days). The resulting figure is the estimated number of vehicles that visited the areas from July 1 to September 5, 1977. Multiplied by the average number of people per vehicle (obtained through the personal interviews) a use estimate in recreational visits was obtained.

Use estimates for the East Fork Camp and Ponderosa Camp were based on traffic counts and register box responses while use estimates for "other areas" were based on random observations. Since this data was not obtained systematically, the estimates for these less intensively used areas could reflect considerable error. They should represent rough estimates, however, probably on the low side. Given the manpower, equipment, and time, it's the best data available for use estimation in these areas.

Total recreational use in the Dillon Resource Area for the July 1 to September 5 period is estimated at just over 34,000 recreational visits. The study period did not include any of June or the last three weeks in September. Therefore, total recreational use for the summer of 1977, would be somewhat higher, especially since fishing pressure on the Madison River is most intense early in the summer during the Salmon fly hatch. Taking the unsampled periods into account, recreational use would probably be at least 40,000 visits for the entire summer in the Dillon Resource Area.

TABLE 1

SUMMER USE ESTIMATES FOR THE DILLON RESOURCE AREA
(IN RECREATIONAL VISITS, JULY 1 TO SEPTEMBER 5, 1977)

<u>LOCATION</u>	<u>MAXIMUM DAILY CAPACITY</u>	<u>AVERAGE WEEKDAY</u>	<u>AVERAGE WEEKEND DAY</u>	<u>ESTIMATED TOTAL USE</u>
PIONEER STUDY AREA TOTAL	320	69	199	7892
Ruby Reservoir	150	24	69	2994
Divide Bridge	33	13	24	1124
Dickie Bridge	30	13	17	973
Ponderosa	12	2	3	156
Big Sheep Creek	75	14	55	1824
East Fork Camp	20	3	13	421
Other Areas		Data not Available		400
MADISON STUDY AREA TOTAL		316	479	26146
DILLON RESOURCE AREA TOTAL		385	678	34038

Table 2 shows the sampling schedule used to obtain data from each of the Pioneer Study Areas intensively used camps and indicates how many vehicles were observed at the site on the given day. The average number of vehicles observed is also present based on the five weekday observations and four weekend day observations. Assuming 3.1 persons per vehicle, these figures were the basis for deriving the total use estimates presented in Table 1.

Table 3, the value of recreation to Montana's economy (in dollars), shows that recreation involving BLM lands in southwest Montana adds nearly a quarter of a million dollars (\$246,809) to the State economy. The table presents the average daily expenditure in Montana per person, for each area and sub-area. Multiplying the average daily expenditure figures (obtained through personal interviews with over 500 recreationists) by the estimated total number of visits to the area yields the figure used in determining the value of the BLM recreation experience to Montana's economy. The daily expenditure figure reflects any money spent in Montana by the recreationist for food, gas, lodging, equipment, services, and any other expenditures directly attributed to the recreation experience.

Once again, the figure of \$246,809 is low for the summer season since data was not collected during June or most of September. Including these periods in the study would probably raise the figure to over \$300,000.

B. RESPONSES TO THE QUESTIONNAIRE

A total of 1302 vehicles were observed in the nine areas of concentrated recreation use in the Dillon Resource Area from July 1 to September 5, 1977; 319 in the Pioneer Study Area and 983 in the Madison Study Area. Of the 1302 observed vehicles, interviews were conducted with representatives of 505 vehicles; 327 in the Madison Study Area and 178 in the Pioneer Study Area. The 327 in the Madison Study Area were contacted for interviews. Overall, interviews were conducted with 39% of the observed vehicles in the Dillon Resource Area.

This section presents the question by question responses to the questionnaire, a copy of which appears in Appendix B.

I. Origin of Trip

Table 4 indicates the percentage of resident and non-resident recreationists in the Dillon Resource Area and sub-areas. The table compares the percentages obtained through vehicle observations to those percentages obtained through personal interviews. This information is shown in order to indicate to what extent the interviews were representative of the observed population. The percentages obtained through the vehicle observations is more statistically sound since it represents a considerably larger sample.

TABLE 2

THE NUMBER OF OBSERVED VEHICLES IN THE PIONEER STUDY AREAS'S
INTENSIVELY USED CAMPS

	WEEKDAYS	DATE	WEEKENDS	DATE
Ruby Reservoir	17	7/15	47	7/ 3
	11	7/18	35	7/31
	5	7/26	25	8/13
	9	8/24	18	9/ 4
	<u>1</u>	9/ 1	—	
	9*		31*	
Divide Bridge	4	7/28	10	7/ 2
	1	8/ 1	12	7/10
	7	8/ 5	3	7/16
	4	8/23	4	8/14
	<u>3</u>	8/31	—	
	4*		8*	
Dickie Bridge	4	7/28	9	7/ 2
	4	8/ 1	7	7/10
	6	8/ 5	1	7/16
	6	8/23	7	8/14
	<u>7</u>	8/31	—	
	5*		6*	
Big Sheep Creek	3	7/19	23	7/ 4
	4	7/25	17	7/ 9
	4	8/ 3	17	8/20
	4	8/11	9	9/ 4
	<u>6</u>	8/25	—	
	4*		17*	

*Average number of vehicles

TABLE 3

VALUE OF BLM SUMMER RECREATION TO MONTANA'S ECONOMY
(IN DOLLARS)

<u>LOCATION</u>	<u>AVERAGE DAILY EXPENDITURE IN MONTANA PER PERSON</u>	<u>ESTIMATED # OF DAILY RECREATIONAL VISITS, 7/1 to 9/5</u>	<u>ESTIMATED VALUE ADDED TO MONTANA ECONOMY</u>
Pioneer Study Area Total	\$6.89	7892	\$ 54375
Ruby Reservoir	6.11	2994	18293
Divide Bridge	7.96	1124	3947
Dickie Bridge	9.69	973	9428
Ponderosa	9.39	156	1464
Big Sheep Creek	7.40	1824	13497
East Fork Camp	8.63	421	3633
Other Areas	6.98	400	2792
Madison Study Area Total	7.36	26146	192434
Dillon Resource Area Total	7.24	34038	246809

TABLE 4

RESIDENCE OF SUMMER RECREATIONISTS IN THE DILLON R.A.

LOCATION	% RESIDENT	% NON-RESIDENT	% RESIDENT	% NON-RES
	(BASED ON 319 OBSERVATIONS)		(BASED ON 178 INTERVIEWS)	
Pioneer Study Area				
Total	57.9	42.1	57.1	42.9
Ruby Reservoir	69.2	30.8	71.4	28.6
Divide Bridge	64.5	35.5	63.3	36.7
Dickie Bridge	61.5	38.5	60.0	40.0
Big Sheep Creek	24.3	75.7	20.5	79.5
Madison Study Area	(BASED ON 983 OBSERVATIONS)		(BASED ON 272 INTERVIEWS)	
Total	42.0	58.0	26.9	73.1
Dillon Resource Area	(BASED ON 1302 OBSERVATIONS)		(BASED ON 505 INTERVIEWS)	
Total	45.9	54.1	37.8	62.2

In the Pioneer Study Area, the interviews were very representative of the observations, but in the Madison Study Area there was a bias toward interviewing non-residents. This fact may have influenced the type of responses given in this area, but since there was little difference between most resident and non-resident responses, the bias is probably insignificant.

For the Dillon Resource Area as a whole non-residents outnumber residents 54.1% to 45.9%, based on 1302 observations. The observed non-resident to resident ratio in the Madison Study Area was 58.0% to 42.07%, while Montana residents comprised 57.9% of the observed recreationists in the Pioneer Study Area. Clearly, BLM lands in the Pioneer Study Area are used by a more local crowd since it lacks the national reputation enjoyed by the Madison Study Area. One site within the Pioneer Study Area, however, does receive far more non-resident use than resident. Seventy-five percent of the recreationists in Big Sheep Creek are non-resident, a fact explained by the creek's proximity to the Idaho border and distance from Montana population centers.

Table 5 reports the origin of non-resident recreationists in the Pioneer Study Area. Table 6 shows the same information for the Madison Study Area. In the Pioneer Study Area, non-resident recreationists came from seventeen States and one Canadian Province while in the Madison Study Area, thirty-two States and three Canadian Provinces were represented. In both areas California was the most well represented State. Twenty-nine percent of the non-residents in the Pioneer Study Area and 30% in the Madison Study Area came from California. Idaho and Utah respectively sent 22% and 20% of the non-resident recreationists to the Pioneer Study Area, and together with California account for the bulk of non-residents (71%) in that area. In the Madison Study Area, California far outdistanced the other thirty-one States and three Provinces. Thirty percent of the non-resident recreationists came from that State. Utah (7%), Colorado (7%), and Idaho (6%) follow California with a combined total of 20% of the non-resident recreationists.

2. Transportation Mode

Table 7 shows what percentage of recreationists in the Dillon Resource Area traveled by various modes of transportation. In both the Pioneer and Madison Study Area, vehicles pulling trailers were the most frequently observed mode of transportation. Passenger autos were the second most popular means of travel. Pickups with campers and camper shells, pickups, and motor homes were also frequently observed.

3. Number of People Per Vehicle

The average number of people per vehicle, as computed from the questionnaire, was 3.1 for both study areas and the Resource Area as a whole.

TABLE 5

ORIGIN OF NON-RESIDENT SUMMER RECREATIONISTS
IN THE PIONEER STUDY AREA

<u>STATE</u>	<u>PERCENTAGE</u>
California	29
Idaho	22
Utah	20
Washington	6
Oregon	5
Colorado	3
Wisconsin	3
Alberta	3
Other	9

TABLE 6

ORIGIN OF NON-RESIDENT RECREATIONISTS IN THE
MADISON STUDY AREA

<u>STATE</u>	<u>PERCENTAGE</u>
California	30
Utah	7
Colorado	7
Idaho	6
Washington	4
Illinois	4
Arizona	4
Indiana	3
Nevada	3
Texas	3
Wyoming	3
New Jersey	3
Alberta	2
Nebraska	2
Oregon	2
Other	17

4. Destination of Trip

Table 8 indicates what percentage of recreationists in each study area had the study area as their primary recreation destination, as one of several destinations, or simply as a brief stopping point while passing through. Although the Madison River is nationally renowned as a prime recreation area, only 37% of those interviewed viewed it as their primary destination. Twenty-one percent simply passed through the Madison Study Area, undoubtedly attributed to the fact that the area is so close to Yellowstone Park. Comparable figures in the Pioneer Study Area indicate that it was the primary destination of a far greater percentage of recreationists (63%) while only 6% used the area as a stopping point as they traveled through.

5,6,7. Number of Days on Trip, in Montana, in Area, at Site

This information is displayed in Table 9. In general, trips involving a stay in the Madison Study Area tended to be longer than those trips to the Pioneer Study Area, again emphasizing the more local, short term use in the latter area. Recreation trips to or through the Dillon Resource Area BLM lands average just over three weeks, with eleven days spent in Montana and 4.5 nights at the interview site.

8. Type of Lodging and Type of Campground

This information was not computed for the Pioneer Study Area. Virtually all of the recreationists interviewed there were obviously staying at the BLM facility or using the facility on a day use basis. Recreationists in the Madison Study Area employed a variety of lodging types (see Don Baty's Madison Study).

Table 10 shows the type of shelter utilized by those recreationists staying in BLM campgrounds in the Dillon Resource Area. More recreationists used trailers than any other form of shelter in all study areas, with campers and tents also frequently employed.

9. Primary Activities

The primary activities engaged in by the recreationists are displayed in Table 11. Responses to this open ended question were numerous but have been grouped into four broad categories for this report.

10. With Outfitter

This question was meaningful only on the Madison River at MoAtee Bridge, where outfitters were frequently employed by fishermen as river guides.

TABLE 7

TRANSPORTATION MODE OF SUMMER RECREATIONISTS IN
THE DILLON RESOURCE AREA

<u>VEHICLE TYPE</u>	<u>PIONEER STUDY AREA PERCENTAGE</u>	<u>MADISON STUDY AREA PERCENTAGE</u>
Auto	22	23
Pick-up	10	6
Pick-up with camper	13	13
Pick-up with camper shell	7	6
Vehicle with trailer	30	29
4-Wheel drive vehicle	6	3
Motorcycle	0	0
Motor home	3	6
Van	3	6
Bus	0	0
Airplane	.5	6

TABLE 8

DESTINATION OF RECREATIONISTS, IN PERCENT

<u>LOCATION</u>	<u>PRIMARY DESTINATION</u>	<u>ONE OF MULTIPLE DESTINATIONS</u>	<u>TRAVELING THROUGH</u>
Pioneer Study Area Total	63	31	6
Madison Study Area Total	37	42	21

TABLE 9
SUMMER TRIP LENGTH IN DAYS

<u>LOCATION</u>	<u>ENTIRE TRIP LENGTH</u>	<u>LENGTH IN MONTANA</u>	<u>LENGTH IN AREA*</u>	<u># OF NIGHTS AT SITE</u>
Pioneer Study Area Total	16.1	8.4	3.7	3.3
Ruby Reservoir	21.2	9.0	3.8	4.3
Divide Bridge	15.6	9.6	4.1	1.9
Dickie Bridge	13.7	7.9	3.0	2.4
Big Sheep Creek	6.9	4.6	3.4	3.3
Madison Study Area Total	25.6	12.5	8.0	5.2
Dillon Resource Area Total	22.2	11.1	6.5	4.5

*Area refers to Beaverhead County for Pioneer data, and to the Madison River for Madison data.

TABLE 10

TYPE OF SHELTER IN INTENSIVELY USED AREAS, IN PERCENT

<u>LOCATION</u>	<u>TENT</u>	<u>TRAILER</u>	<u>CAMPER</u>	<u>CAMPER SHELL</u>	<u>VAN</u>	<u>MOTOR HOME</u>	<u>NONE</u>
Pioneer Study Area Total	14.9	38.3	18.4	5.7	9.2	9.9	3.5
Ruby Reservoir	9.7	38.7	27.4	6.5	1.6	14.5	1.6
Divide Bridge	13.0	30.0	17.4	8.7	21.7	4.3	4.3
Dickie Bridge	13.6	31.8	31.8	4.5	0.	13.6	4.5
Big Sheep Creek	26.5	14.7	14.7	2.9	0.	2.9	5.9
Madison Study Area Total	23.0	41.3	15.9	2.8	6.3	7.9	2.8
Dillon Resource Area Total	19.9	40.7	16.5	3.7	7.2	8.5	3.0

TABLE 11

PRIMARY ACTIVITY OF SUMMER RECREATIONISTS
PERCENT ENGAGED IN EACH ACTIVITY

<u>LOCATION</u>	<u>FISHING</u>	<u>ROCKHOUNDING</u>	<u>CAMPING/ RELAXING</u>	<u>OTHER</u>
Pioneer Study Area Total	63	4	21	8
Ruby Reservoir	40	19	27	14
Divide Bridge	73	0	23	4
Dickie Bridge	66	0	27	7
Big Sheep Creek	90	0	10	0
Madison Study Area Total	70	0	6	24
Dillon Resource Area Total	68	2	26	3

11. Items the Recreationists Spent Money For

This information was not computed but indicated what sort of goods different kinds of recreationists spent their recreational dollar on. As might be expected, campers who were just traveling through the areas generally stated that they spent money only on food, drink, and gas, with gas often mentioned as the major trip expense. Campers who stayed in the areas spend their money on food, drink, gas, fishing tackle and licenses, and sporting goods. Those recreationists who were with an outfitter or guide spent money in Montana on all the aforementioned goods plus guide fees.

12, 13. Total Estimated Expenditure for Trip Per Vehicle, and Estimated Expenditure Per Vehicle in Montana

Table 12 reports the average daily expenditure per person for each study area and the resource area as a whole. To derive the per person per day expenditure figure, the total trip expenditure per vehicle figure was divided first by the average length of trip figure, then divided again by the average number of people per vehicle.

Table 13 compares daily per person resident expenditures to non-resident expenditures. As expected, non-residents tend to spend more money daily on their trip, both in Montana and for the entire trip.

14. Number of Prior Visits and Years Ago First Visit

The average number of prior visits computed for all of the Dillon Resource Area is 18.4, with the typical recreationist visiting the area for the first time 8.7 years ago. The typical recreationist in the Madison Study Area visited the area 17 previous times, beginning eight years ago. In the Pioneer Study Area, recreationists had been in the area twenty previous times, beginning nine years ago.

15. Access

An overwhelming majority of respondents (98.3%) in the Pioneer Study Area felt that access to the BLM camp was adequate. Only 1.7% felt that access to the areas was inadequate. In the Madison Study Area, the question referred to access to the Madison River in general. In response to this question, 70% felt access was adequate while 16% felt access to the river was inadequate. Fourteen percent had no opinion.

TABLE 12
AVERAGE DAILY EXPENDITURE, PER PERSON
(IN DOLLARS)

<u>LOCATION</u>	<u>FOR ENTIRE TRIP</u>	<u>FOR STAY IN MONTANA</u>
Pioneer Study Area Total	6.08	6.89
Ruby Reservoir	4.44	6.11
Divide Bridge	7.87	7.96
Dickie Bridge	10.18	9.69
Big Sheep Creek	10.20	7.40
Madison Study Area Total	7.36	6.10
Dillon Resource Area Total	8.20	7.71

TABLE 13
RESIDENT vs. NON-RESIDENT DAILY EXPENDITURE, PER PERSON
(IN DOLLARS)
DILLON RESOURCE AREA

	<u>For Entire Trip</u>	<u>For Stay in Montana</u>
Montana Resident	5.45	5.58
Non-resident	8.94	8.21

16. Recreation Facilities

This information is displayed in Table 14. Nearly a third (31%) of the recreationist in the Pioneer Study Area felt that the campgrounds' recreation facilities were inadequate. Most of the complaints centered around the lack of tables, flat camping sites, toilet facilities, and a boat ramp at Ruby Reservoir. The other 62% however, felt that recreation facilities in the Pioneer Study Area were certainly adequate. Many expressed the belief that more facilities would attract more people and tend to spoil the area's undeveloped nature.

In the Madison Study Area (which has more developed camping facilities) 88% of the respondents felt that the recreation facilities were adequate, while only 12% expressed the belief that facilities were lacking.

For the Dillon Resource Area as a whole, 81% of the respondents felt facilities were adequate, with 19% indicating facilities could be improved.

17. Likes

Table 15 reports the responses to this question. A wide variety of responses were given, but for purposes of clarity, they have been grouped into four categories; fishing, undeveloped nature, other, no opinion. More respondents like the undeveloped nature of the areas than anything else...56% throughout the Dillon Resource Area. In the Madison Study Area, 41% indicated that their main like was the fishing, while the comparable figure for the Pioneer Study Area was 29%.

18. Dislikes

Once again, the wide variety of responses to this question were grouped into four general categories; nothing, lack of trees or facilities, boats, and other. Other dislikes included such things as rattlesnakes, wind or inclement weather, or poor fishing. Over half of the respondents in the Dillon Resource Area (56%) said they had no dislikes. The figure was 67% for the Pioneer Study Area, but only 50% for the Madison Study Area. Boats were an insignificant dislike in the Pioneer Study Area, but 9% interviewed in the Madison indicated that boats were their main dislike. Lack of trees or facilities was a dislike expressed by 15% of those interviewed in the Pioneer Study Area, and 10% in the Madison Study Area. This information is displayed in Table 14.

TABLE 14

% OF RESPONDENTS FEELING FACILITIES AT SITE ARE INADEQUATE

<u>LOCATION</u>	<u>%</u>
Pioneer Study Area Total	32
Ruby Reservoir	39
Divide Bridge	27
Dickie Bridge	25
Big Sheep Creek	23
Madison Study Area Total	12
Dillon Resource Area Total	20

TABLE 15

LIKES; PERCENT GIVING SAME RESPONSE

<u>LOCATION</u>	<u>FISHING</u>	<u>UNDEVELOPED NATURE</u>	<u>OTHER</u>	<u>NO OPINION</u>
Pioneer Study Area Total	29	58	12	1
Madison Study Area Total	41	56	3	0
Dillon Resource Area Total	37	56	6	2

TABLE 16

DISLIKES; PERCENT GIVING SAME RESPONSE

<u>LOCATION</u>	<u>NOTHING</u>	<u>LACK OF TREES OR FACILITIES</u>	<u>BOATS</u>	<u>OTHER</u>
Pioneer Study Area Total	67	15	0	18
Madison Study Area Total	50	10	9	31
Dillon Resource Area Total	56	12	5	27

19. Return

Virtually 99% of the recreationists interviewed in the Pioneer Study Area indicated they would return to the area at a future date. The figure was the same for the Madison Study Area and for the Resource Area as a whole. This single positive response implies that in general the recreationists are satisfied with their experience on BLM lands.

20. BLM Awareness

Table 17 presents this information. Fifty-six percent of the respondents in the Dillon Resource Area said they were unaware they were recreating on BLM lands. The aware figure was slightly higher in the Madison Study Area (58%) and slightly lower in the Pioneer Study Area (53%).

21. Attempted to Locate Other BLM Lands

In the Dillon Resource Area, only 16% of the respondents indicated they had ever attempted to locate BLM lands other than developed campsites. However, 74% of those who had attempted to locate non-developed BLM lands experienced difficulty in doing so.

22. Aware of Maps

Seventy-eight percent of those interviewed in the Dillon Resource Area were not aware that the BLM provides recreation maps indicating the location of National Resource Lands.

23. Part of Larger Group

In the Dillon Resource Area, 42% of the respondents were part of a larger group. The average group size was 10.8 people. A higher percentage of people in the Pioneer Study Area (65%) were part of a larger group, and the group size of 12.8% was also larger than in the Resource Area as a whole. Fewer people were part of larger groups in the Madison Study Area (30% of the respondents) and the group size of 3.8 persons was smaller than in the Pioneer Study Area.

TABLE 17
BLM AWARENESS

<u>LOCATION</u>	<u>% AWARE BLM LAND</u>	<u>% UNAWARE BLM LAND</u>
Pioneer Study Area Total	47	53
Ruby Reservoir	58	42
Divide Bridge	27	73
Dickie Bridge	36	64
Big Sheep Creek	46	54
Madison Study Area Total	42	58
Dillon Resource Area Total	43	57

CHAPTER IV
CONCLUSIONS ON THE SUMMER SEASON

A. SUMMER USE IN THE PIONEER STUDY AREA

I. Ruby Reservoir Campground

The undeveloped campground at Ruby Reservoir received more recreational use than any BLM camp in the Pioneer Study Area. Nearly 8,000 visits were made to the area between July 1 and September 5, 1977. The popularity of Ruby Reservoir was due to the fact that it provides such a wide variety of recreation opportunities. Fishing, dirt biking, rock hounding, swimming, water skiing, and just relaxing are some of the activities frequently engaged in at Ruby Reservoir. Water sport activities naturally focused around the lake, while rockhounding occurs throughout the surrounding Ruby Mountains. Dirt biking is popular along the Davey Creek, Barton Gulch, and Idaho Creek roads just east of the lake. These roads provide access to many acres of BLM lands. Dirt bikers occasionally create a disturbance by riding through the camp itself, which annoys the rest of the campers.

In addition to these activities, many recreationists at Ruby Reservoir make trips to Trudeau Warm Springs on the opposite side of the lake from the campground. The small lake is a beautiful swimming hole that features refreshing waters, tropical fish, colorful rocks and lush vegetation. The spring itself is on private land, but is nearly surrounded by BLM lands and provided outstanding recreational experiences for the general public.

Recreationists who used Ruby Reservoir between July 1 and September 5 added an estimated \$12,000 to Montana's economy. This figure was considerably higher than the value added to Montana's economy by any of the other intensively used sites in the Pioneer Study Area, in spite of the fact that recreationists at the Reservoir spend less money per person per day than at the other areas.

Ruby Reservoir was a very popular recreation site for southwestern Montanans. In fact, the area was used by the highest percentage of residents of any location in the Dillon Resource Area (69.2%). This local clientele was mostly from Butte and has typically come to the reservoir for many years. Most of these recreationists were short term users, arriving on Friday afternoon and staying until Sunday afternoon.

Ruby Reservoir was very popular for group gatherings. Several large scale family reunions numbering over forty persons occurred throughout the summer, most notably over the Fourth of July weekend. In addition, the campground was the rendezvous point for several out-of-state groups that have frequented the area for many years. Groups enjoy the BLM camp at Ruby Reservoir because the wide open camping area allows them to park their trailers and campers close together. At the same time, individual parties can pull their trailers to a corner of the field and enjoy a fairly secluded camping experience, except on the most crowded weekends when seclusion is unattainable.

Several of the out-of-state groups at Ruby Reservoir stay at the area on a long term basis while others use the campground as a base camp for exploratory trips throughout Montana. Staying at the reservoir for a while, they take leave for a week or so and travel to Glacier or Yellowstone, only to return to Ruby where they regroup with friends and spent some more time relaxing. At least one group from Washington, Claifornia, and Oregon repeated this routine throughout the summer.

Physically, Ruby Reservoir Campground has suffered as a result of the intensive use it attracts. The road is severely rutted, and most of the grass in the loop area has been killed by people who drive and park over it indiscriminately. Consequently, blowing dust is a problem whenever the wind blows. Also, the soil in the campground has been compacted to the point where it is doubtful weather new growth could occur. Water is no longer able to soak into the ground, and when it rains the entire area becomes a slick quagmire. Through the course of summer, the problems of vegetation destruction and soil compaction became noticeably worse as vehicles continued to drive in the grassy areas to avoid the road ruts.

The campground is not adequately maintained. Trash cans consistently overflowed during the summer. When the wind blew, the litter was scattered throughout the campground, much of it collecting in the lush lakeshore vegetation. The situation created a serious eyesore. In addition, the restroom facilities are inadequate for the number of people using the area. They are quite offensive; consequently, some people choose to use the nearby bushes instead, which further degrades the area's resources.

Responses from the questionnaire would indicate that many of the recreationists at the reservoir recognize the existing problems and are in favor of rectifying them through proper management. Thirty-nine percent of the recreationists at Ruby Reservoir felt that facilities in the area were inadequate. This figure was considerably higher than the comparable figures for other Dillon Resource Area campgrounds (see Table 14). The most frequently given responses for facilities improvement at the camp were, in order; a water pump, picnic tables, cleaner toilets, more toilets, shade, more trash cans, a concrete boat ramp, and leveling of campsites.

Many other recreationists at Ruby Reservoir (61%) felt that facilities were adequate, although this figure is considerably lower than that found at the other areas. These respondents argued that facilities improvement would only attract more visitors which would, in their opinion, spoil the area. In actuality, failure to improve facilities at Ruby Reservoir will result in a truly spoiled natural resource.



Photo 1: "Water levels drop drastically toward the end of August"



Photo 2: "Most of the grass in the loop area has been killed by people who drive and park over indiscriminately."



Photo 3: "The campground is not adequately maintained".



Photo 4: Ruby Reservoir Camground

One sentiment was frequently expressed by both those who felt facilities were adequate and by those who were in favor of improvements. Both groups are adamantly against the development of "pigeon hole" campsites that would restrict their ability to camp in groups.

In general, the lack of a camping fee, the wide variety of recreational opportunities available, and the primitive nature of the area are attractive incentives for recreationists to visit Ruby Reservoir Campground. Without a doubt, the area will continue to experience heavy summer use in the years to come.

2. Divide Bridge Camp

During the July 1 to September 5 study period, it is estimated that 1124 recreationists visited the BLM camp at Divide Bridge. The vast majority of recreationists at this site were there to fish and camp. Very few other recreational activities were undertaken at Divide, although some people simply stopped to picnic.

Like Ruby Reservoir, Divide Bridge Camp is very popular with local Mountananns, especially residents of Butte. Sixty-five percent of the Divide visitors were from Montana. Many of those interviewed were observed at the camp on several occasions throughout the summer.

In general, the recreationists at Divide Bridge Camp were very satisfied with the level of development in the area. Seventy-three percent of those interviewed felt facilities were adequate. Nevertheless, 27% indicated that more development would be desirable. Among this group's chief complaints were the lack of a toilet in the picnic area, the lack of tables at the campsites, not enough trash cans, and lack of drinkable water. Several respondents also complained about lack of access in general to the Big Hole River, but others appreciated the fact that the BLM camps were on the river. People also indicated that they kept coming back to the BLM camp at Divide because of the lack of a fee and the easy access.

Divide Bridge Camp is not marked from the highway, a fact that probably explains why an incredible 73% of the recreationists in the area were unaware that they were on BLM land. This figure is far greater than comparable figures for any other area within the Dillon Resource Area (see Table 16).

The camp suffers from a lack of a toilet near the highway. Attractive stands of green vegetation are being defiled, with toilet paper becoming a major litter problem in the area. In addition, some recreationists who camped near the existing outhouse were not even aware of its presence, since it is well concealed behind a thick stand of aspen. Consequently, toilet paper litter is considerable at this end of the camp also.



Photo 5: The picnic area at Divide Bridge.



Photo 6: A camping area at Divide Bridge

The dirt road serving the campground is in extremely bad condition. This situation is especially critical for recreationists pulling trailers, who make up the majority of visitors to the camp. Access from this road into the campsites appears adequate, and the secluded campsites offer excellent recreational experiences.

The lack of designated fire pits has resulted in the crude construction of up to three fire rings per campsite. After one group makes and uses the fire ring they construct, the next group often destroys it and constructs their own in a more suitable place. Consequently, black charcoal dust covers most of several campsites, creating scenic blight and killing off native vegetation.

In conclusion, Divide Bridge Camp is an extremely attractive area that offers recreationists rewarding fishing, camping, or picnicking experiences. However, natural resources such as lush, natural vegetation are suffering because of a lack of management. The construction of an additional restroom facility near the picnic area and the placement of fire rings in campsites would go a long way toward eliminating these problems.

3. Dickie Bridge Camp

The BLM camp at Dickie Bridge on the Big Hole River received less use than any of the four intensively used Pioneer Study Area sites. Nevertheless, it is estimated that nearly 1,000 recreational visits were made to the area between July 1 and September 5, 1977. Recreationists using Dickie Bridge Camp pumped an estimated \$9,428 into Montana's economy.

Like Ruby Reservoir and the Divide Bridge Camp, Dickie Bridge attracts mostly resident recreationists (61.5%). Although the Big Hole River is a nationally famous trout stream, its out-of-the-way location makes it less popular with out-of-state visitors. As a result, it is used primarily by Montanans who have frequented the river for many years.

The lack of an outhouse at the west end of Dickie Bridge Camp has resulted in a serious toilet paper and human waste problem in an especially beautiful stand of lodgepole pine. Also, the existing toilet at the east end of the campground needs to be serviced more frequently.

Insects are a major problem in the area early in the summer, but become less bothersome as the season progresses.

The road through the campground is in good shape, as are the spur roads that lead to the individual campsites. The group camping area is severely rutted, however, and suffers because of the lack of designated driving and parking areas. Muddy potholes and a lack of ground vegetation (grasses) results, both of which detract from the area's beauty.



Photo 7: The main road and group camping area (left) at Dickie Bridge



Photo 8: Riverbank campsite, Dickie Bridge.

The small campsites between the road and the river may be dangerously close to the five foot bank, which could eventually collapse under the weight of a large recreational vehicle.

Only 25% of the recreationists at Dickie Bridge felt that facilities were inadequate. This group of respondents suggested that the BLM provide picnic tables, dig a well, clean the outhouse, and put in fire rings. Those who felt facilities were adequate generally stated that more improvements would attract more people, which would ruin the campground's rural atmosphere.

Like Divide Bridge, the primary activities at Dickie were fishing, camping, and relaxing. Dirt biking along the camp road that leads to Bryant Creek was also popular with at least one group of recreationists.

4. Ponderosa Camp

The remoteness of Ponderosa Camp and the extremely bad stretch of road leading to it resulted in only an estimated 156 recreational visits to the area during the summer study period. Of these recreationists, approximately 40% were from out of state. Most Montana residents came from Butte.

Very little overnight use occurred at Ponderosa during the summer. Many of the people who used the camp stayed at Maiden Rock Campground (two miles downstream) and made day trips up the road's end at Ponderosa. The lack of overnight use reflects the condition of the road, which undoubtedly discourages people from pulling their trailers or driving their campers to the camp.

In spite of the minimal amount of use in the area, Ponderosa Camp suffers from a litter problem. Careless recreationists pile cans and trash in the fire pit, a situation that detracts considerably from the area's intrinsic value. The aforementioned road that leads up to Ponderosa Camp is in bad need of repair, but vegetation and soil in the camp itself remain unspoiled.



Photo #9

Ponderosa
Camping
Area

Special Topic: The Big Hole River

Throughout the summer, numerous Big Hole interviewees complained about poor quality trout fishing and the abundance of whitefish. According to these respondents, the fishing in 1977 was not nearly what it has been in the past years. Extremely low water levels during the summer of 1977 may have contributed to this situation, but more probably, high pollution levels in the river are degrading the trout habitat. Cattle waste is apparently the main pollutant. The banks of the Big Hole are intensively grazed and several streams discharge directly into the river after flowing through the middle of cattle feed lots. This situation no doubt contributes to the greenish color and foamy surface of the Big Hole waters. These conditions would not indicate optimum trout habitat.

Further studies need to be undertaken to determine just how severe the pollution problem on the Big Hole River is and to what extent it affects the fishing. The lack of trout in the river was mentioned by enough people to indicate that indeed a problem exists, a problem that could result in fewer recreationists visiting the area and subsequent loss of important local revenues.

5. Big Sheep Creek

The undeveloped camping areas along Big Sheep Creek were visited by an estimated 1824 recreationists between July 1 and September 5, 1977. The creek is an outstanding trout producer, and most of the activity there revolves around fishing. In addition, children enjoy floating along the tamer stretches of the creek, and dirt bikers and four wheelers take Big Sheep Creek Road up to Morrison Lake and other points near the Continental Divide, on up the Muddy Creek Road.

Unlike the other survey sites in the Pioneer Study Area, Big Sheep Creek is not used primarily by Montanans. Only 24% of those observed during the study period were Montana residents. The overwhelming majority of recreationists in the canyon were from Utah, Idaho and California.

Large groups of people were observed camping in the open grassy meadows along the creek while individual campsites among lush canyon vegetation were ideal for one party campouts. In general the area is popular for family groups as well as retired couples. Surprisingly, 46% of the recreationists in Big Sheep Creek Canyon were aware that they were on BLM land, this in spite of the fact that obvious signs are lacking.

Big Sheep Creek Canyon can adequately absorb most of recreational use it presently experiences. The most notable exception is found in the lower stretch of canyon just above the Deadwood Gulch Road where a cluster of three or four campsites exists. The spur road into this camping area is badly rutted, and vegetation in the area is being destroyed by vehicles that drive off the road to avoid the ruts. Litter in the bushes is somewhat of a problem here also.



Photos 10 and 11: Popular camping areas, Big Sheep Creek



Only 23% of the recreationist at Big Sheep Creek felt that there should be facilities improvement in the canyon. Suggestions for improvement included constructing a toilet, placing out trash cans, and possibly a few tables. The overwhelming majority of recreationists, however, seek Big Sheep Creek as a recreation site because of the lack of development and its unspoiled nature. These people are in favor of no recreational facilities development in the canyon.

Indeed, Big Sheep Creek doesn't appear to be in need of much management at this point in time. This is because the level of use along the creek is not great enough to cause noticeable resource damage (except in the forementioned area). Also, recreational use is evenly distributed throughout the canyon, which eliminates many problems associated with intensive use of a small camping area.

The access road which leads up the canyon is generally in good condition. Although vehicles drive off this road directly onto grassy meadows along the creek and set up camps in stands of willows, very little vegetation destruction occurs in most areas. In addition, the out-of-State visitors almost always pack out their trash, so there is very little litter in the area. Most of the observed vehicles and trailers were self contained, so there is little need for rest-rooms or tables. Another indication that the creek does not suffer from over-use is that the fishing is still excellent.

Although Big Sheep Creek remains basically unspoiled in spite of nearly 2,000 recreational visits during the summer study period, levels of use in the canyon should be closely monitored in years to come. A significant increase in use will undoubtedly begin to adversely affect the natural resource.

6. East Fork Camp

During the summer survey period (July 1 to September 5), an estimated 421 recreationists visited the remote East Fork Camp, located at the end of the road that leads up the East Fork of the Blacktail Deer Creek. Fishing, dirt biking, and simply camping were the main activities undertaken in the area.

The recreationists at the East Fork Camp were generally very local in nature, mostly coming from Dillon. These people did not look favorably upon recreationists from other towns who used the camp, expressing the belief that "non-locals" overfish the area and don't belong there in the first place.

East Fork recreationists vehemently opposed any kind of development at the camp and do not favor improving the incredibly bad forty mile dirt road that leads up to it. Improvements would only attract more people, they argue, and consequently ruin the area for them. The locals don't seem to realize that they are recreating on public lands, but rather believe that they are responsible for managing it. Threats of violence were directed toward the BLM or any other Federal agency that would attempt to restrict use on "their" land.



Photo 12: Damaged register box, East Fork Canyon



Photo 13: Severely rutted camping area, East Fork Canyon

Recreationist who used the East Fork Camp generally pack out their non-flammable trash and consistently used the same fire rings, so visual blight was not a serious problem. The level of use, however, probably warrants the establishment of an outhouse near the main camping area. The grassy camping area is being destroyed by vehicles driving over and into it and dirt bikers who use the trails leading into the Snowcrest Range may be adversely affecting wildlife and vegetation in the pristine back country. This problem needs to be studied further.

7. Other Pioneer Study Areas

The remainder of BLM lands in the Pioneer Study Area are dominated by wide open sagebrush covered range with little water. Understandably, these lands did not attract many recreationists during the summer of 1977. Those who did recreate on them were generally engaged in rockhounding or dirt biking, but accurate estimates of the amount of activity in these areas was difficult to obtain. Through random observations and letter inquiries to rockhound clubs in Idaho known to use the areas, an estimated 400 recreationist visited Pioneer Study Areas other than those already discussed.

No meaningful conclusions can be drawn concerning the widely dispersed recreational use of these BLM lands due to the lack of data. It appears, however, that no serious problems resulted from the amount and kind of recreational use these lands received during the summer of 1977. (For information concerning fall recreation of these lands, see Part II of this report).

B. SUMMER USE IN THE MADISON STUDY AREA

For a detailed report on the Madison Study Area conclusions, see Chapter V of Don Baty's WICHE Report.

C. THE RESOURCE AREA AS A WHOLE: CONCLUSIONS

Based on over 500 interviews, a number of conclusions can be made about summer recreation in the Dillon Resource Area. First, the area is a popular vacation spot for non-residents, with 54% of the recreationists coming from out of State. Nearly a third of the recreationists came in a vehicle pulling a trailer, and the average number of recreationist per vehicle was 3.1. Most of the folks viewed the Resource Area as being on the way to somewhere else, but spend an average 4.5 days at the BLM facilities. The most popular activity engaged in by the recreationists was clearly fishing, with camping, water sports, rockhounding, and dirt biking also popular.

The recreationist spend money in Montana for food, gas and oil, fishing licenses, and tackle, other sporting goods, and lodging. The average visitor spend \$8.20 per day in Montana, with non-residents spending more than residents. These people typically had been to the BLM sites many time before and felt that recreation facilities in the area were adequate. They mostly liked the fishing and the lack of a fee and disliked nothing. They would not like the BLM to make any improvements that would result in a fee. Ninety-nine percent indicated they would return.

Over half of the recreationists (56%) were not aware that they were on BLM land and an even higher proportion (74%) indicated that if they had tried to locate undeveloped BLM lands on other occasions, they had experienced difficulty in doing so. In short, the BLM suffers from an obvious identity problem but nevertheless provides a variety of summer recreation opportunities for many people.

CHAPTER V RECOMMENDATIONS

A. THE PIONEER STUDY AREA

This section presents a number of recommendations for each recreation area within the Pioneer Study Area. The first recommendation listed for each area should be considered most important, the second recommendation should be considered next in importance, and so on.

I. Ruby Reservoir

The BLM camp at Ruby Reservoir attracts more recreationists and has experienced more resource damage than any camp in the Pioneer Study Area. In addition, more recreationists at Ruby Reservoir indicated they wanted more facilities development than at any other Pioneer camp. Therefore, the following recommendations concerning its future management should be viewed as top priority.

- a. Regrade the camp road and restrict driving to this road by placing wooden barriers along the shoulders. This would prevent people from driving over existing areas of grass which results in erosion problems and loss of scenic contrast. All roads should be wide enough to accommodate large recreational vehicles pulling trailers.
- b. Establish driveways from the road into designated individual and group camping areas. Group camping areas should be able to accommodate 55-60% of the camp's capacity. One should be located in the loop area; another should be located along the north-south running road south of the loop. Individual campsites should fringe the loop area and extend to the south along the road. Campsite turnouts should also be bordered with wooden barriers to prevent people from driving into camping areas.
- c. Each individual campsite should be equipped with at least a picnic table and possibly a fire pit. Group sites should have several tables and a large fire pit.
- d. More trash cans are needed, and they need to be emptied more frequently. The individual responsible for this task at present has failed to do an adequate job. A BLM employee should be made responsible for the job.
- e. Add two more toilet facilities to the camp. The southwest or southeast side of the loop road would be the best location. The toilets need to be maintained and serviced on a more regular basis.
- f. Sink a well in the camp, if feasible, to provide water for non-self contained campers.
- g. Acquire Trudau Warm Springs as an additional BLM recreation site. Intensive use by the public indicates the need for management by a public agency.

- h. Erect a large, visible sign at the camp entrance identifying the recreation area.
 - i. Prohibit dirt biking in the campground itself, except when the machine is used as a transportation mode in and out of the camp.
2. Divide Bridge Camp
- a. The most urgent need at Divide Bridge Camp is for a toilet near the picnic area. This should be located at the south end of the picnic area and should not be hidden by trees. In addition, a sign indicating the location of the existing restroom should be placed at the other end of the campground. Many recreationists are unaware of its presence since it is obscured by trees.
 - b. A fire pit should be constructed in the picnic area and in each individual campsite as well as the group camping area.
 - c. Tables should be placed in the camping areas.
 - d. The road should be regraded.
 - e. A well should be sunk to provide fresh water for non-self contained campers.
3. Dickie Bridge Camp
- a. Place and maintain an outhouse and trash cans at the west end of the campground.
 - b. Designate campsites and driving areas in the large camping area by bordering them with logs. This will prevent people from driving over inappropriate landscapes and help preserve the area's beauty. In addition, the driveway into this camping area should be graded to eliminate some nasty ruts and mud holes.
 - c. Designate camping and parking areas within the campsites that are along the river bank. This will alleviate the problem of bank erosion that seems to be occurring.
 - d. Picnic tables and fire pits should be placed in each individual campsite.
 - e. Dig a well for fresh, running water.
4. Ponderosa Camp
- a. The road leading into the camp should be graded, especially from Maiden Rock on.
 - b. A picnic table should be placed in the camping area.
 - c. The existing outhouse should be replaced or at least repainted.

5. Big Sheep Creek

Although no serious problems exist at present along Big Sheep Creek, now is the time to take preventive measures that will preserve the resource for future generations.

- a. Designate driving, parking, and camping areas in the meadows and flat lands adjacent to the creek. These areas receive considerable use, and anticipated use increases will begin to adversely affect vegetation and soil in the canyon.
- b. Construct an outhouse near the group camping areas between Shearing Pen Gulch and Caboose Canyon.
- c. Place picnic tables in the camping areas (low priority).

6. East Fork Camp

- a. Undertake a study to determine the effects of dirt biking in the pristine wilderness above the camp.
- b. Restrict driving and parking in the camp to appropriate areas so as not to destroy existing vegetation.
- c. Erect an outhouse back in the trees behind the camp.

B. MADISON STUDY AREA

For a detailed set of recommendations concerning the Madison Study Area, see Don Baty's WICHE Report.

C. THE RESOURCE AREA IN GENERAL

1. Many of the camps in the Pioneer Study Area are in need of facilities' improvement and development in order to avoid irreparable damage to the resource. On the other hand, several camps in the Madison Study Area are overdeveloped with facilities and improvements not being fully utilized. The BLM should seriously consider moving some improvements (especially picnic tables and toilets) from those under-used Madison campsites to the needy Pioneer camps.
2. The lack of a camping fee at BLM camps attracts many people, especially long-term users. Whenever possible, the BLM should continue its no fee policy. But in some areas (such as Ruby Reservoir) the establishment of fees may be necessary to offset the costs of making the necessary improvements. In such cases, fees should be established. Although the public will object, many of the high priority recommendations must be enacted in order to avoid irreparable damage to national resource lands.

Preservation of valuable recreation lands should not be hindered by a lack of money. In those cases where BLM funds are inadequate to get the job done, the public should bear some of the cost through camping fees.

3. All of the Pioneer Study Area camps need signs to identify them. Also, signs encouraging campers to pack out their trash should be placed in those areas where trash cans are absent.

Part II

Fall Recreation
in the
Dillon Resource Area

PART II - FALL RECREATION IN THE DILLON RESOURCE AREA

Part II of this report estimates the amount of 1977 fall recreational use in the BLM's Dillon Resource Area. Use estimates were generated for each BLM allotment in the Dillon West, Tendency, and Centennial Planning Units. Estimates were also made for BLM lands outside of these planning units, but only where concentrated activity was observed. Recreation in the Dillon West, Tendency, and Centennial Planning Units was scrutinized more closely (i.e. allotment by allotment) since Unit Resource Analysis updates for allotments in these planning units were needed before updates for other planning units. Due to a lack of time, not all planning units could be dealt with in detail.

In years of normal snowfall, recreation on BLM lands during the fall would include hunting, snowmobiling, ski-touring, snowshoeing, and other snow related activity. But in 1977, due to a lack of snow on the ground, fall recreation in the Dillon Resource Area was limited to hunting. Upland game birds, waterfowl, and antelope were hunted directly on BLM lands, as were some deer and elk. Also a portion of deer and elk hunting that occurred on Forest Service land could be attributed to BLM land since the hunters camped on BLM land or the game depended on BLM land for subsistence.

CHAPTER VI METHODS OF USE AND VALUE ESTIMATION

Several measurement techniques were used to estimate fall recreational use on Dillon Resource Area BLM lands. These techniques included aerial observations, habitat and herd census analysis, and ranchers' estimates of recreation use on their lands.

A. AERIAL OBSERVATIONS

Flights over Dillon Resource Area BLM lands during the fall of 1977 were an excellent way to determine where hunting activity occurred and how intense the activity was. Flights were made on the opening days of waterfowl, antelope, and big game seasons. During the flights, the researcher noted how many vehicles were observed on BLM lands, their approximate location, and the type of activity the occupants were engaged in.

The vehicle was the basic unit of measurement in the aerial survey technique. Information collected from the air in terms of vehicles was translated into seasonal hunter day estimates in two steps, which are described in the following hypothetical case:

Let's assume that ten vehicles were observed on a given allotment on opening day of waterfowl season and that the vehicles' occupants were obviously engaged in waterfowl hunting. Multiplying the number of observed vehicles times the average number of waterfowl hunters per vehicle provided an accurate estimate of how many waterfowl hunters used the allotment on opening day.

Through interviews conducted with 1977 fall recreationists (see following chapter), the average number of people per vehicle was determined for various kinds of hunting. These figures are as follows:

<u>TYPES OF RECREATION</u>	<u>AVERAGE NO. OF PEOPLE PER VEHICLE</u>
Waterfowl Hunting	2.5
Upland Game Hunting	2.6
Antelope Hunting	2.7
Deer Hunting	3.0
Elk Hunting	3.0

In our example, (10 observed vehicles) X (2.5 waterfowl hunters per vehicle) would indicate 25 hunters on the allotment on opening day.

The Montana Department of Fish and Game has conducted a twenty year State-wide study and found the number of days the average hunter spends pursuing particular types of game. These figures are presented in the following table:

<u>TYPE OF GAME SOUGHT</u>	<u>AVERAGE NO. OF DAYS HUNTED</u>
Antelope	2.5
Deer	5.3
Elk	7.3
Waterfowl	7.3
Upland Game	3.2

The average waterfowl hunter hunts 7.3 days during the season. Multiplying this figure times the number of waterfowl hunters observed on the allotment on opening day yields an estimate of total waterfowl hunter days on the allotment for the entire season. In our example, 25 hunters x 7.3 days hunted = 182 hunter days on the allotment for the season.

Of course, this technique should not imply that the hunters observed on the allotment on opening day would necessarily be the hunters there on another day. But hunters who worked another area on opening day would be likely to use the observed allotment later in the season, just as those who worked the allotment opening day would be likely to hunt other areas later in the season. Therefore, the average number of days hunted times the number of hunters observed on an allotment on opening day provides accurate estimates of total season use. Expressed as an equation:

$$\text{Total Season Hunter Days on an Allotment} = \left(\frac{\# \text{ of Vehicles Observed on Opening Day}}{\# \text{ of Vehicles Observed on Opening Day}} \right) \times \left(\frac{\text{Ave. \# of Persons Per Vehicle}}{\text{Ave. \# of Persons Per Vehicle}} \right) \times \left(\frac{\text{Ave. \# of Days Hunted}}{\text{Ave. \# of Days Hunted}} \right)$$

for each kind of hunting activity.

A variation on this technique involved estimating the amount of deer and elk hunting that could be attributed to BLM land even though the hunting didn't take place on BLM land.

Many big game hunters set up camps on BLM land but hunt on adjacent Forest Service land. Obviously, the entire hunter day in these cases could not be attributed to BLM lands but certainly a portion of it could be. An arbitrary value of .5 hunter days was assigned to each hunter observed camping on BLM land but hunting on USFS land. The assumption here was that half of the hunting experience could be attributed to the land upon which the hunters established base camps. Season long estimates, then, for an allotment that served as a campground were derived according to the following formula:

$$\left(\frac{\# \text{ of Vehicles Observed Camping at Site on Opening Day}}{\# \text{ of Vehicles Observed Camping at Site on Opening Day}} \right) \times \left(\frac{\text{Avg. \# of Big Game Hunters Per Vehicle}}{\text{Avg. \# of Big Game Hunters Per Vehicle}} \right) \times \left(\frac{.5 \text{ Hunter Days}}{.5 \text{ Hunter Days}} \right) \times \left(\frac{\text{Avg. \# of Days Hunted}}{\text{Avg. \# of Days Hunted}} \right)$$

Aerial observations provided the researcher with very accurate estimates of hunting use on BLM lands on opening day. By combining this information with figures obtained by the MDF&G, season long use estimates were made with a high degree of confidence.

B. HERD CENSUS ANALYSIS

This method is one of two utilized by BLM wildlife biologists to estimate the number of hunter days on a given grazing allotment. The technique relies on a knowledge of the number of animals that use the allotment for browse and/or cover, either seasonally or all year long. Usually, this knowledge is acquired through aerial census flights.

Assuming a harvest of 15% of wildlife big game populations and knowing both the number of animals that depend on the allotment for survival and the

average number of days hunted per animal harvested provides us with enough information to estimate hunter day values for the allotment.

To determine the average number of days hunted per animal harvested, the following calculation is used:

$$\begin{array}{l} \text{Avg. \# of Days} \\ \text{Hunted Per} \\ \text{Animal Harvested} \end{array} = \frac{(\text{Avg. \# of Annual Hunters})(\text{Avg. \# of Days Hunted})}{(\text{Avg. \# of Animals Harvested})}$$

This computation was performed for each kind of game hunted, utilizing MDF&G data obtained through a twenty year State-wide harvest summary. For instance, mule deer data was plugged into the above formula in the following manner:

$$\frac{(144,269 \text{ Avg. Animal Hunters})(5.3 \text{ Days Hunted})}{(107,607 \text{ Deer Harvested Annually})} = 7.1 \text{ Days Hunted Per Deer Harvested}$$

The calculation was performed for each kind of game sought on BLM lands in Southwest Montana. The results were as follows:

<u>Game</u>	<u>Avg. \# of Days Hunted Per Animal Harvested</u>
Deer	7.1
Antelope	3.5
Elk	43.2
Waterfowl	.714
Upland Game	.89

Let's assume that ten deer were observed on a given allotment. According to proper harvest rates, 15% of the deer herd will be taken, or (10) x (.15). Knowing that an average of 7.1 days are hunted for each deer harvested, the calculation that yields a hunter day estimate for the allotment is:

$$(10) \times (.15) \times (7.1) = 10.6 = 11 \text{ Deer Hunter Days}$$

on the allotment for the season.

Through herd census analysis, fairly accurate estimates of hunter days on a given allotment can be generated for various types of game.

C. ACRES OF HABITAT ANALYSIS

Another method of estimating hunter days on allotments involves analyzing the amount of habitat the allotment provides for given types of game. Hunter day values are printed annually by MDF&G in progress reports, but their data is in terms of hunting districts and Counties. The problem is that a County encompasses hundreds of BLM allotments.

Knowing the number of hunter days within the hunting district as a whole and knowing the amount of habitat provided by that County (in terms of

acres), we can determine the number of hunter days attributed to each acre of habitat. For example, we know that within Beaverhead County there are 664,000 acres of sage grouse habitat and a total of 2,790 hunter days within the same area per season.

$$\frac{2,790}{664,000} = 4.2 \times 10^{-3} \text{ Hunter Days/Acre of Habitat}$$

If a given allotment contains 1,800 acres of sage grouse habitat, it provides:

$$(4.2 \times 10^{-3}) \times (1800) = 7.6 = 8 \text{ Hunter Days Per Season}$$

This technique of hunter day estimation is not as reliable as herd census analysis but yields rough estimates when no better data is available.

Hunter day estimates based on habitat and herd census analysis were generated by wildlife biologists Wayne Elliott, Lew Myers, and John Sadowski.

D. RANCHER ESTIMATES

Early in 1977, questionnaires were mailed to ranchers who hold BLM grazing allotment leases. Among other questions, the ranchers were asked to estimate the amount of recreation, by activity, on their allotment. The rate of return on the forms was exceptionally poor, but estimates were made for some allotments. The reliability of such estimates is suspect at best. However, on those allotments where no other data was gathered (either from the air or in terms of herd census or habitat analysis) rancher estimates were used if they were available.

E. VALUE ESTIMATION

Estimating the economic value of fall recreation on BLM grazing allotments simply involved multiplying the estimated number of hunter days on the allotment times the value of one hunting day.

The Office of Policy Analysis, Department of the Interior, has supplied a standardized list of hunter day values to be used in all AMP economic analyses. These values, however, are somewhat higher than those figures found by BLM researchers during the fall of 1977. It's the author's opinion that recreationists in the field simply tend to underestimate the amount of money they spend on a holiday. Hence, the discrepancy in values.

The following table compares those hunter day values recommended for use by the Department of Interior to those obtained through personal interviews.

Hunter Day Values		
	<u>OPA FIGURES</u>	<u>BLM FIGURES</u>
Deer	\$24.00	\$21.00
Antelope	\$41.00	\$27.00
Elk	\$43.00	\$29.00
Waterfowl	\$ 9.00	\$ 8.00

In estimating the economic value of fall recreation on BLV lands, the Department of Interior's OPA figures were used according to prescribed procedure.

CHAPTER VII
FALL USE ESTIMATES

A. DILLON WEST AND TENDON

Table 13 presents hunter day estimates for each BLM grazing allotment within the Dillon West and Tendoy Planning Units. The table also indicates the economic value associated with the amount of hunting activity that occurred.

Due to a variety of circumstances, estimates could not be made for every allotment or for certain types of activity within a given allotment. Where data was not available but activity was assumed to occur, "unknown" appears. "Unknown" should indicate that further study in the area is needed to determine the amount of activity that occurs on the allotment. A "No Habitat" for an activity in an allotment indicates that the activity does not occur in the area due to a lack of suitable environment or some other factor.

(See Table 18 on following page.)

TABLE 18

FALL RECREATION USE ESTIMATES AND \$ VALUE

AREA	HUNTER DAYS/VALUE *					VALUE OF KNOWN RECREATION
	DEER	ANTELOPE	ELK	WATERFOWL	UPLAND GAME	
DILLON WEST P.U. TOTAL	376/\$9024	559/22919	759/32637	0/0	251/\$1506	\$66086
0028 Scudder Creek	unknown	unknown	unknown	no habitat	unknown	unknown
0004 Selway	"	7/\$287	11/\$473	"	"	\$ 760
0005-6 Stonehouse	16/\$384	47/\$1927	unknown	"	"	\$ 2311
0014 Barretts	unknown	unknown	no habitat	unknown	"	unknown
0015 Bannack	"	13/\$533	"	no habitat	"	\$ 533
0016 Chinatown	"	13/\$533	65/\$2795	"	"	\$ 3328
0017 Coyote Flats	"	7/\$287	no habitat	"	"	\$ 287
0018 Bear Creek	"	40/\$1640	33/\$1419	"	"	\$ 3059
0019 Rape Creek	50/\$1200	20/\$820	50/\$2150	"	100/\$600	\$ 4770
0020 No. Black Canyon	unknown	13/\$533	44/\$1892	"	unknown	\$ 2425
0025 Trail Crk Seeding	"	unknown	no habitat	"	"	unknown
0026 Anderson Field	"	20/\$820	"	"	"	\$ 820
0030 Reservoir Creek	"	47/\$1927	"	"	"	\$ 1927
0031 PHW	"	27/\$1107	"	"	78/\$468	\$ 1575
0034 Red Mine	"	unknown	"	"	unknown	unknown
0035 Brenner	"	"	"	"	"	unknown
0038 Baldy Mountain	64/\$1536	"	unknown	"	"	\$ 1536
0130 So. Black Canyon	unknown	13/\$533	131/\$5633	"	"	\$ 6166
0120 Holland-Carroll	"	unknown	no habitat	"	"	unknown
0121 Frenchie-Carroll	"	13/\$533	"	"	"	\$ 533
0122 Taylor Cr.-Buff.Cr	unknown	5/\$205	"	"	5/\$30	\$ 235
0132 Leadman	"	35/\$1435	"	"	17/\$102	\$ 1537

*Value=(hunter days)(value of one hunter day)

TABLE 18 (CONTINUED)

FALL RECREATION USE ESTIMATES AND \$ VALUE (CONTINUED)

AREA	HUNTER DAYS/VALUE*					VALUE OF KNOWN RECREATION
	DEER	ANTELOPE	ELK	WATERFOWL	UPLAND GAME	
DILLON WEST P.U. (CONTINUED)						
0110 Pipe Organ	10/\$240	20/\$820	no habit	no habit.	3/\$18	\$ 1078
0124 Cedar Creek	9/\$216	10/\$410	"	"	18/\$108	\$ 734
0197 Bell Ranch	unknown	7/\$287	unknown	"	unknown	\$ 287
0706 Wheat	no habit.	unknown	no habit.	"	"	unknown
0168 Timber Butte	unknown	14/\$574	"	"	"	\$ 574
0156 Maiden Creek	11/\$264	3/\$123	100/\$4300	"	5/\$30	\$ 4717
0145 Lemhi Pass	55/\$1320	unknown	260/11180	"	3/\$18	\$12518
0725,6 Horse Prairie	unknown	7/\$287	22/\$946	"	unknown	\$ 1233
0753 Bannock Pass	"	14/\$574	unknown	"	"	\$ 574
0149,50 Rocky Hills	"	34/\$1394	no habit.	"	"	\$ 1394
0165 Coyote Creek	"	7/\$287	11/\$473	"	"	\$ 760
0118 Antelope Butte	no habit	10/\$410	no habit	"	2/\$12	\$ 422
0135 Big hole Road	"	1/\$41	"	"	2/\$12	\$ 53
0131, 0133 Frying Pan	unknown	35/\$1435	"	"	unknown	\$ 1435
0161 Buzz Tail	"	unknown	"	"	"	unknown
0160 Burns Mountain	"	"	"	"	"	unknown
0173 Gallader Creek	18/\$432	"	"	"	7/\$42	\$ 474
0171 Henneberry Ridge	5/\$120	50/\$2050	"	"	3/\$18	\$ 2188
0182 Kennison Spring	53/1272	unknown	32/\$1376	"	unknown	\$ 2648
0709, 0192 Shoshone Cove	85/2016	14/\$594	no habit	"	6/\$36	\$ 2626
0755 Alkali Creek	unknown	6/\$246	"	"	2/\$12	\$ 258
0745 Taylor Creek	"	7/\$287	unknown	"	unknown	\$ 287

*Value=(hunter days)(value of one hunter day)

TABLE 18 (CONTINUED)

FALL RECREATION USE ESTIMATES AND \$ VALUE (CONTINUED)

AREA	HUNTER DAYS/VALUE*					VALUE OF KNOWN RECREATION
	DEER	ANTELOPE	ELK	WATERFOWL	UPLAND GAME	
TENDON P. U. TOTALS	431/10344	306/12546	593/25499	0/0	130/780	\$49169
0001 Pine Creek	unknown	13/\$533	33/\$1419	no habit.	unknown	\$ 1952
0022 Dixon Mtn	"	unknown	unknown	"	"	unknown
0039 Muddy Creek	12/\$288	"	44/\$1892	"	"	\$ 2180
0041 Rock Creek	unknown	7/\$287	no habit.	"	"	\$ 287
0009 Junction Seeding	"	13/\$533	"	"	"	\$ 533
0042 Meadow Creek	unknown	unknown	unknown	unknown	"	unknown
0193 Bell Canyon	6/\$144	7/\$287	22/\$946	no habit.	3/\$18	\$ 1395
0108 Hanson	unknown	27/\$1107	77/\$3311	"	unknown	\$ 4418
0748 Medicine Lodge	50/\$1200	27/\$1107	44/\$1892	"	25/\$150	\$ 4349
0158 Simpson Creek	unknown	47/\$1927	44/\$1892	"	22/\$132	\$ 3951
0741 Indian Creek	8/\$192	13/\$533	33/\$1419	"	7/\$42	\$ 2186
0101 Little Divide	35/\$840	26/\$1066	33/\$1419	"	25/\$150	\$ 3475
0700 Rio Puerco	26/\$624	no habit.	122/\$5246	"	unknown	\$ 5870
0107 Porcupine Creek	unknown	13/\$533	22/\$946	"	"	\$ 1479
0107 Four Eyes	26/\$624	7/\$287	no habit.	"	26/\$156	\$ 1067
0119 Pass Creek	17/\$408	13/\$533	43/\$1849	"	3/\$18	\$ 2808
0720 Whitworth	17/\$408	13/\$533	43/\$1849	"	unknown	\$ 2790
0195 Williams	145/\$3480	27/\$1107	no habit.	"	"	\$ 4587
0126 Ellis Peak	55/\$1320	13/\$533	"	"	7/\$42	\$ 1895
0150 Radio-T.V. Tower	18/\$432	13/\$533	"	"	11/\$66	\$ 1031
0102 Cabin Creek	unknown	7/\$287	"	"	unknown	\$ 287
0758 Dad Creek	16/\$384	7/\$287	11/\$473	"	2/\$12	\$ 1156

*Value=(number of hunter days)(value of one hunter day)

TABLE 18 (CONTINUED)

FALL RECREATION USE ESTIMATES AND \$ VALUE (CONTINUED)

AREA	HUNTER DAYS/VALUE*					VALUE OF KNOWN RECREATION
	DEER	ANTELOPE	ELK	WATERFOWL	UPLAND GAME	
TENDRY P. U. (CONTINUED)						
0699 Nicholia School	unknown	13/\$533	22/\$946	no habit.	10/\$60	\$ 1539
OTHER AREAS TOTALS	668/16032	182/7462	985/42355	456/4104	unknown	\$69953
Humbug Spire	382/\$9168	no habit.	unknown	no habit.	"	\$ 9168
McCartney Mtn	unknown	unknown	350/15050	"	"	\$15050
Clark Canyon	175/\$4200	"	263/11309	"	"	\$15509
Ashbough Mtn	111/\$2664	"	175/\$7525	"	"	\$10189
Upper Sage Creek	unknown	182/\$7462	unknown	"	"	\$ 7462
Lima Reservoir	"	unknown	no habit.	456/\$4104	"	\$ 4104
East Fk Blacktail	"	"	197/\$8471	no habit.	"	\$ 8471

B. FALL USE ESTIMATES: OTHER AREAS

Fall recreation in the form of hunting occurred throughout the Resource Area, but allotments in other Planning Units were not analyzed individually as they were in Dillon West and Tendov. However, general areas of recreational use can be identified based on aerial observations undertaken during the fall of 1977.

1. Humbug Spires

The area referred to as Humbug Spires includes all BLM land north of the Camp Creek Road and including the Primitive Area, and between I-15 and the Forest Service boundary. Access to the area is provided by the Camp Creek, Soap Gulch, and Moose Creek roads. Fairly intensive use was observed in this area on opening day of deer and elk season. Twenty vehicles hunted the area on opening day, most of whom were hunting deer. A season long estimate for the area would be:

$$(24 \text{ Vehicles}) \times (3 \text{ Per Vehicle}) \times (5.3 \text{ Days}) = 382 \text{ Deer Hunter Days}$$

in the Humbug Spires Area. In terms of economic value:

$$(382 \text{ Hunter Days}) \times (\$24.00 \text{ Per Deer Day}) = \$9,168.$$

2. McCartney Mountain

Located just east of Glen and north of the Big Hole River, McCartney Mountain is an area that is intensively hunted, given its relatively small size. Sixteen vehicles were observed on the mountain on opening day of elk season, most of whom were hunting elk (verified by subsequent interviews with the hunters). Translated into a season long estimate,

$$(16 \text{ Elk Hunting Vehicles}) \times (3 \text{ Per Vehicle}) \times (7.3 \text{ Days Hunted}) = \\ 350 \text{ Elk Hunter Days on McCartney Mountain.}$$

In terms of economic value,

$$(350 \text{ Elk Hunter Days}) \times (\$43 \text{ Per Day}) = \$15,050.$$

3. Clark Canyon

This large canyon above Clark Canyon Dam also experienced heavy elk and deer hunting use during the fall of 1977. Within the Clark Canyon drainage, 23 vehicles were observed on BLM lands on the opening day of deer and elk season. It was difficult to tell which vehicles were involved in hunting what kind of game, so an even mix was assumed.

$$(12 \text{ Elk Hunting Vehicles}) \times (3 \text{ Per Vehicle}) \times (7.3 \text{ Days}) = \\ 263 \text{ Elk Hunter Days} \quad 263 \times \$43.00 = \$11,309$$

$$(11 \text{ Deer Hunting Vehicles}) \times (3 \text{ Per Vehicle}) \times (5.3 \text{ Days}) = \\ 175 \text{ Deer Hunter Days} \quad 175 \times \$24.00 = \$4,200$$

4. Ashbough Mountain

In the Blacktails, Ashbough Mountain is about 5 miles south of Irishman's Hole. Fifteen elk and deer hunting vehicles were observed in the vicinity of Ashbough Mountain on BLM lands. Again, an even mix of deer and elk hunters was assumed.

$$\begin{array}{ll} (8 \text{ Elk Vehicles}) \times (3 \text{ Per Vehicle}) \times (7.3 \text{ Days}) = & \\ 175 \text{ Elk Hunter Days} & 175 \times \$43.00 = \$7,525 \end{array}$$

$$\begin{array}{ll} (7 \text{ Deer Vehicles}) \times (3 \text{ Per Vehicle}) \times (5.3 \text{ Days}) = & \\ 111 \text{ Deer Hunter Days} & 111 \times \$24.00 = \$2,664 \end{array}$$

5. Upper Sage Creek

Also located in the Blacktail Planning Unit, Upper Sage Creek Basin includes a huge area east of I-15 between Dell and Clark Canyon Dam. Twenty-seven vehicles were observed on BLM lands in this area on the opening day of antelope season.

$$\begin{array}{ll} (27 \text{ Vehicles}) \times (2.7 \text{ Per Vehicle}) \times (2.5 \text{ Days}) = & \\ 182 \text{ Antelope Hunter Days} & 182 \times \$41.00 = \$7,462 \end{array}$$

Most of this antelope hunting activity occurred in the area around Big Spring Gulch and Little Spring Gulch.

6. Lima Reservoir

Lima Reservoir is almost entirely surrounded by BLM land, and this land was heavily hunted during waterfowl season. Twenty-five vehicles hunted the area around the lake and along the river immediately above the reservoir.

$$\begin{array}{ll} (25 \text{ Vehicles}) \times (2.5 \text{ Per Vehicle}) \times (7.3 \text{ Days}) = & \\ 456 \text{ Waterfowl Hunter Days} & 456 \times \$9.00 = \$4,104 \end{array}$$

BLM lands around Lima Reservoir and in the Centennial Valley in general were also hunted heavily during antelope season. Unfortunately antelope hunting data was not collected in the Valley since weather prevented flying the area. Elk, deer, and moose were also hunted in the Centennial Mountains as well as on the north side of the Valley.

7. East Fork of the Blacktail

The East Fork Road ends in BLM land at the base of the Snowy Crest Range. The campground at the end of the road is heavily utilized by elk hunters. On opening day of elk season, 18 vehicles were observed camping at the East Fork Camp.

$$\begin{array}{ll} (18 \text{ Vehicles}) \times (3 \text{ Per Vehicle}) \times (7.3 \text{ Days}) \times (.5 \text{ Days}) = & \\ 197 \text{ Elk Hunter Days} & 197 \times \$43.00 = \$8,471 \end{array}$$

The seven general areas just discussed have been looked at fairly carefully in terms of fall recreation. However, further study in subsequent years is needed in order to accurately determine recreation values for each allotment in the areas.

CHAPTER VIII CONCLUSIONS AND RECOMMENDATIONS, FALL STUDY

Many of the hunters the researchers interviewed during the fall of 1977 complained about the lack of game. Undoubtedly, this is due to the fact that hunting pressure has increased in recent years. The following discussion pertains to this problem.

The abundance of off road vehicles and "jeep trails" has made it relatively easy for numerous hunters to gain access to prime big game habitat. In years past, such areas were attainable only by foot or on horseback and hunting pressure was low enough to sustain healthy herds of deer and elk. The proliferation of roads has resulted in too many hunters working areas that are needed by the animals for security cover and general habitat.

In many areas, numerous roads provide access to the same general area. In such cases, only one road should be kept open; the rest should be closed. This would allow the habitat to return to its natural, undisturbed state and support larger game herds.

The problem is not limited to established roads. Many vehicles drive indiscriminately over the landscape. "Cross county" driving was observed in mountainous deer and elk habitat as well as plains-like antelope habitat. In all areas, the activity destroys browse, creates unsightly ruts, causes erosion and generally infringes on wildlife habitat. Management policy should make cross country driving on public lands illegal.

Problems associated with off road vehicles affect all agencies involved in land management. Inter-agency studies and action would result in preservation of big game populations that are otherwise likely to decline in future years. At present, roads push up virtually every draw and canyon in southwest Montana, providing easy hunting access for multitudes of vehicles. If this situation is not dealt with soon, the value of hunting in Montana will surely decline.

In terms of specific areas, the East Fork of the Blacktail hunter camps has been severely degraded in 1977. The once grassy camping area is now deeply rutted, the result of heavy trucks driving off the road to park trailers and unload supplies. Several trees were cut down for firewood and semi-permanent improvements were constructed in the area. The camp sorely needs management that would restrict vehicles to the road and prohibit cutting trees for firewood.

PART III
AREAS THAT PROVIDE BOTH SUMMER AND FALL RECREATION

Having analyzed summer and fall recreation in the Dillon Resource Area, we can now assign recreation values to those areas that provide both summer and fall recreation. In Table 19, total recreational use estimates are made in terms of dollar value for those allotments and areas that experience utilization during the summer and the fall.

Total use estimates presented in this section are the result of several research techniques. These techniques are described in detail in the "Research Methodology" sections of Part I and Part II of this report. Readers who wish to see discussions of the methods used to arrive at the following figures are advised to refer to those preceeding sections.

TABLE 19
RECREATIONAL VALUE IN AREAS KNOWN TO EXPERIENCE
BOTH SUMMER AND FALL RECREATION

AREA	VALUE OF SUMMER REC.	VALUE OF FALL REC.	TOTAL VALUE
DILLON WEST P. U. TOTAL	\$ 675	\$66086	\$66761
Rabe Creek	175	4770	4945
Horse Prairie	500	1233	1733
TENDOY P. U. TOTAL	19290	49169	68459
Medicine Lodge	1000	4349	5349
Rio Puerco	9120	5870	14990
Four Eyes	4610	1067	5627
Whitworth	4560	2308	5160
OTHER AREAS TOTAL	3633	69953	73586
East Fork Blacktail	3633	8471	12104

AFTERWORD

The preceeding discussion of recreation in the Dillon Resource Area is not definitive. Many glaring deficiencies appear in terms of unsurveyed areas and crude measurement techniques. This situation exists due to the incredible size of the Dillon Resource Area and a lack of manpower.

This document should, however, lay the groundwork for future studies that will more completely estimate recreational use in the Dillon Resource Area. General areas of known recreation have been identified and dealt with, and recreation in each allotment within two planning units has been analyzed carefully. This analysis should enable BLM planners to consider the value of recreation in those areas that have been studied, and indicate which areas within the Resource Area need to be studied further.

Future studies should be inter-agency in nature, combining the resources and manpower of the BLM, the USFS, and MDF&G. Recreation planners need to develop a method of assigning hunter day values and general recreation benefits to public lands in general. At present, no such technique exists.

APPENDIX A.

VEHICLE AND/OR FLOATER OBSERVATION SHEET

Vehicle Code: 1 - Auto
 2 - Pick-up
 3 - Pick-up w/camper
 4 - Pick-up w/camper shell
 5 - Car or pick-up w/trailer
 6 - 4-wheel drive vehicle
 7 - Motorcycle
 8 - Mobile home
 9 - Van
 10 - Bus
 11 - Other

*Denotes vehicle putting boat in water.

**Denotes boat observed/no vehicle.

n/o Denotes not observed.

Location _____

Weather _____

Sampling period _____

Date _____

Day _____

	Vehicle Code	Number of Occupants	Time	State/County if Montana	Activities Participation
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
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34					
35					
36					
37					

RECREATION USE SURVEY

Location _____ Day _____ Date _____ Weather _____

1. Origin of trip _____.

2. Transportation mode:

- | | |
|--------------------------------|------------------|
| 1. Auto | 7. Motorcycle |
| 2. Pick-up | 8. Mobile home |
| 3. Pick-up w/camper | 9. Van |
| 4. Pick-up w/camper shell | 10. Bus |
| 5. Car or pick-up with trailer | 11. Other _____. |
| 6. 4-wheel drive vehicle | |

3. Number of people in vehicle _____.

4. Destination (s) of trip _____.

5. Length of trip in days _____.

6. Length of stay in Montana _____.

7. Length of stay in (area) _____.

8. Type of lodging while in (area):

1. Motel: Location, Number of nights _____.

2. Campground:

Type of Facility	Name of Camp	# of Nights	Type of Shelter
1. BLM	_____	_____	1. Tent _____
2. BLM undeveloped	_____	_____	2. Trailer _____
3. USFS	_____	_____	3. Camper _____
4. Fish & Game	_____	_____	4. Camper Shell _____
5. Private	_____	_____	5. Van _____
6. Other	_____	_____	6. Mobile home _____
			7. None _____

9. Primary activities in (area)

ActivityWhere Undertaken

10. Are you with an outfitter or guide

1. _____ yes 2. _____ no

11. Are you spending money on this trip for:

- | | |
|------------------------------|-----------------------------|
| 1. _____ food and drink | 5. _____ sporting goods |
| 2. _____ lodging | 6. _____ guide or outfitter |
| 3. _____ gas, oil, etc. | 7. _____ other _____ |
| 4. _____ sporting license(s) | |

12. Total estimated expenditure for this trip per vehicle _____.

APPENDIX B (CONTINUED)

13. Estimated expenditure per vehicle in Montana _____.
14. How many times have you been here before? _____?
(If one or more prior visits) when did you first visit this area? _____.
15. Do you feel there is adequate access to (this area)? 1. ___yes 2. ___no.
If no, why? _____.
16. Do you feel recreation facilities in (this area) are adequate? 1. ___yes 2. ___no
If no, why? _____.
17. What do you like most about (this area)?
18. What do you dislike most about (this area)?
19. Would you return to (this area)? 1. ___yes 2. ___no.
20. a. Are you aware that you're on public lands administered by the BLM?
1. ___yes 2. ___no
b. Are you aware that you'll be floating past BLM lands adjacent to the river?
1. ___yes 2. ___no
21. a. Have you ever attempted to locate BLM lands other than developed campsites?
1. ___yes 2. ___no
b. If yes, have you experienced difficulty in identifying those undeveloped
BLM lands to recreate on: 1. ___yes 2. ___no
22. Are you aware that BLM provides recreation maps indicating the location of
National Resource Land? 1. ___yes 2. ___no
23. a. Is respondent part of a larger group? 1. ___yes 2. ___no
b. If yes, how large a group? _____.
24. Additional comments:

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This report was completed by a WICHE intern. This intern's project was part of the Resources Development Internship Program administered by the Western Interstate Commission for Higher Education (WICHE).

The purpose of the internship program is to bring organizations involved in community and economic development, environmental problems and their students in the West for the benefit of all.

For these organizations, the intern program provides the problem-solving talents of student manpower while making the resources of universities and colleges more available. For institutions of higher education, the program provides relevant field education for their students while building their capacity for problem-solving.

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